

## ORIGINAL ARTICLE

# New cave-dwelling spiders of the family Dictynidae (Arachnida: Araneae) from Guangxi and Guizhou, China

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**Abstract** Twenty-four new spider species of the family Dictynidae from caves of Guangxi and Guizhou in southern China are described, accompanied by line drawings and photomicroscopy images. Fifteen of them belong to *Brommella* Tullgren, 1948: *B. baiseensis* Li, sp. nov., *B. casseabri* Li, sp. nov., *B. chongzuoensis* Li, sp. nov., *B. dolabrata* Li, sp. nov., *B. funaria* Li, sp. nov., *B. josephkohli* Li, sp. nov., *B. linyuchengi* Li, sp. nov., *B. renguodongi* Li, sp. nov., *B. resima* Li, sp. nov., *B. sejuncta* Li, sp. nov., *B. spirula* Li, sp. nov., *B. tongyanfengi* Li, sp. nov., *B. wangfengcheni* Li, sp. nov., *B. xinganensis* Li, sp. nov. and *B. yizhouensis* Li, sp. nov.; eight to *Cicurina* Menge, 1871: *C. avicularia* Li, sp. nov., *C. damaoensis* Li, sp. nov., *C. dong* Li, sp. nov., *C. kailiensis* Li, sp. nov., *C. majiangensis* Li, sp. nov., *C. parallela* Li, sp. nov., *C. wusanani* Li, sp. nov., and *C. zhazuweii* Li, sp. nov.; one to *Lathys* Simon, 1884: *L. inaffектa* Li, sp. nov. Types of all new species are deposited in the Institute of Zoology, Chinese Academy of Sciences in Beijing (IZCAS).

**Key words** Cribellate spiders, taxonomy, *Brommella*, *Cicurina*, *Lathys*.

## 1 Introduction

The spider family of Dictynidae O. Pickard-Cambridge, 1871 is characterized by the distinctive configuration of male palps and respiratory system as seen in typical dictynids. In their male palp, the median apophysis is usually absent, and the tegular apophysis (= “conductor” *sensu* Marusik, Ovchinnikov & Koponen, 2006) is typically sclerotised, cradling a typically long and whip-like embolus. In their tracheal system, thick median trunks extend into the cephalothorax with many fine lateral branches (Griswold *et al.*, 2005).

The family comprises a mixed bag of cribellate and ecribellate spiders falling into several subfamilies. The cribellate Dictyninae build irregular mesh webs with woolly bluish silk among low vegetation and even rainforest canopy. Tricholathysinae build their webs underneath logs, stones and other niches on the ground. The Cicurininae are also ground-dwellers, but their cribellum is reduced. The ecribellate dictynids may be much larger (about 2–8 mm) than the typically small cribellate dictynids (about 1–4 mm).

The Dictynidae is relatively species-rich encompassing 587 species in 53 genera (World Spider Catalog, 2017). Dictynids are distributed worldwide, but more common in temperate countries than in the tropics, and are poorly represented in Australia and Latin America (Lehtinen, 1967; Griswold *et al.*, 2005). Before the current study, 48 species in 13 genera were recorded from China (Li & Lin, 2016), including 3 species known from sub-tropical Guizhou, viz, *Brommella digitata* Lu, Chen & Zhang, 2015, *B. punctosparsa* (Ooi, 1957) and *Lathys chishuiensis* Zhang, Yang & Zhang, 2009. None were

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known in Guangxi, an autonomous region with considerable karst formations in sub-tropical southwestern China.

In our effort to study the subterranean spiders in China, we explored more than 4,000 caves in Guizhou and Guangxi over the last 20 years. Altogether, we collected 50 families of spiders from these caves. The present paper focusses on 24 new species of Chinese cave-dwelling spiders of Dictynidae, comprising 3 genera, viz., *Brommella* Tullgren, 1948; *Cicurina* Menge, 1871; and *Lathys* Simon, 1884. The genus *Cicurina* is transferred from Dictynidae to Hahniidae by Wheeler *et al.* (2016), but not accepted by World Spider Catalog (2017). We follow the latter and preliminarily place *Cicurina* in Dictynidae.

## 2 Material and methods

Spiders were collected in caves by hand. Specimens were examined in 75% ethanol under a Leica M205 C dissection microscope. All drawings were made with a drawing apparatus attached to an Olympus BX51 compound microscope, and then inked on ink jet plotter paper. Photos were taken with an Olympus C7070 wide zoom digital camera (7.1 megapixels) mounted on an Olympus BX51 compound microscope. The images were montaged by Helicon image stacking software. Female genitalia were excised using a fine entomological needle and examined in ventral view in 75% ethanol. Non-chitinous tissues were then cleared in lactic acid to facilitate examination, illustration and photomicroscopy in dorsal view.

The terminology used in text and legends follows Bond & Opell (1997). Additional morphological terms are illustrated in Figure 1.

All measurements are given in millimeters (mm). The total body length does not include the length of the chelicerae or spinnerets. Leg measurements were given as follows: Total length (femur, patella, tibia, metatarsus, tarsus). Leg segments were measured on their dorsal side.

Types of all new species are deposited in the Institute of Zoology, Chinese Academy of Sciences (IZCAS) in Beijing. Paratypes of *Lathys chishuiensis* are deposited in the School of Life Science, Southwest University (SWUC) in Chongqing.

Abbreviations used in the text and legends:

- ALE—anterior lateral eye;
- AME—anterior median eye;
- BO—bursal opening;
- Bu—bursa;
- CD—copulatory duct;
- Cl—length of calamistrum;
- Em—embolus;
- FD—fertilization duct;
- Met IV—length of metatarsus of the fourth leg;
- PLE—posterior lateral eye;
- PME—posterior median eye;
- RTA—retrolateral tibial apophysis;
- SD—sperm duct;
- Sp—spermathecae;
- Spi—tibial spine;
- TA—dictynid tegular apophysis *sensu* Coddington (1990).

## 3 Taxonomy

### Dictynidae O. Pickard-Cambridge, 1871

#### 3.1 Genus *Brommella* Tullgren, 1948

*Brommella* Tullgren, 1948: 156, figs 1A–E. Type species: *Lathys incertus* Miller, 1943.

#### *Brommella baiseensis* Li, sp. nov. (Figs 2–6, 97)

Type material. Holotype. Male, China, Guangxi, Baise City, Pingguo County, Jiucheng Town, Xingning Village,

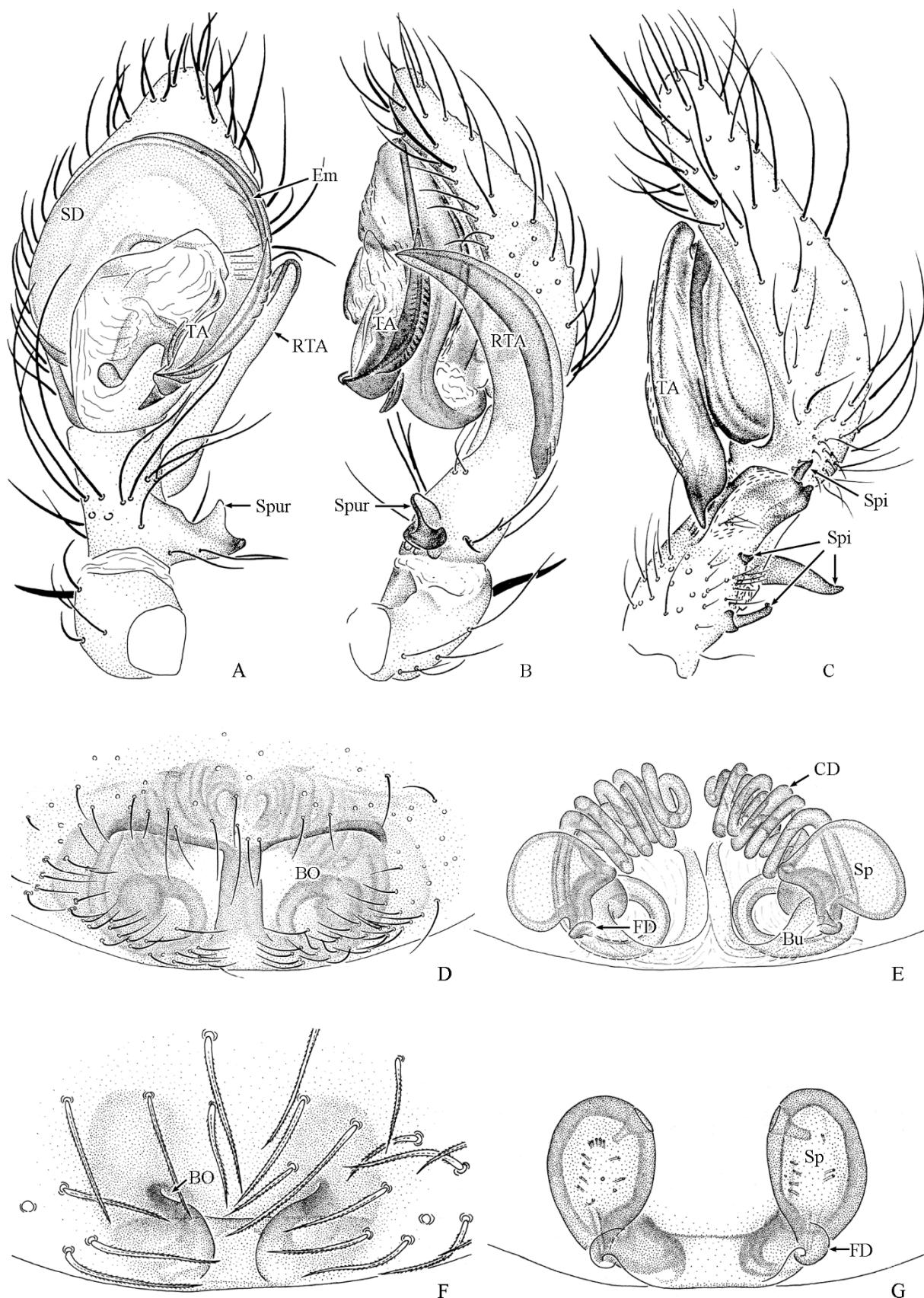


Figure 1. Copulatory organ characters and terminology. A–B. *Brommella linyuchengi* Li, sp. nov. C. *Lathys in affecta* Li, sp. nov. D–E. *Brommella chongzuoensis* Li, sp. nov. F–G. *Brommella sejuncta* Li, sp. nov. A. Left pedipalpus, ventral view. B–C. Left pedipalpus, retrolateral view. D, F. Epigynum, ventral view. E, G. Vulva, dorsal view.

Bafengshan Mountain, Guandimiao Cave, 23°34.022'N, 107°40.763'E, elev. 287 m, 17 October 2010, X. Wang & L. Lin leg., deposited in IZCAS. Paratypes. 3 males, 9 females, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is derived from the type locality; adjective.

**Diagnosis.** This new species is similar to *B. josephkohi* Li, sp. nov. (Figs 21–25), but can be distinguished by the deep notch on the prolateral surface of subtegulum (smooth in *B. josephkohi* Li, sp. nov.), the presence of a branched apophysis towards base of TA (with a simple bump in *B. josephkohi* Li, sp. nov.), TA prolaterally slightly sclerotized (strongly sclerotized and slightly triangular in *B. josephkohi* Li, sp. nov.), the straight, not hooked tibial spur (hooked in *B. josephkohi* Li, sp. nov.), and BO exposed (BO covered in *B. josephkohi* Li, sp. nov.).

**Description.** Male (holotype). Total body length 2.65 (Fig. 6E). Prosoma length 1.20, width 1.00. Cephalic region width 0.50. Carapace pyriform, cephalic part flat, pale, covered with several setae. Thoracic part pale, fovea reduced, prosoma margin in posterior part with black margin. Six eyes, AME absent, all eyes silver, encircled with black. Eye sizes and interdistances: ALE 0.08, PLE 0.09, PME 0.06; ALE–PLE 0.01, PLE–PME 0.05, PME–PME 0.06, ALE–ALE 0.08. Eye region length 0.17, width 0.35. Clypeus height 0.18. Chelicerae length 0.55, width 0.23. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Chelicerae, labium and gnathocoxae light brown; sternum yellow.

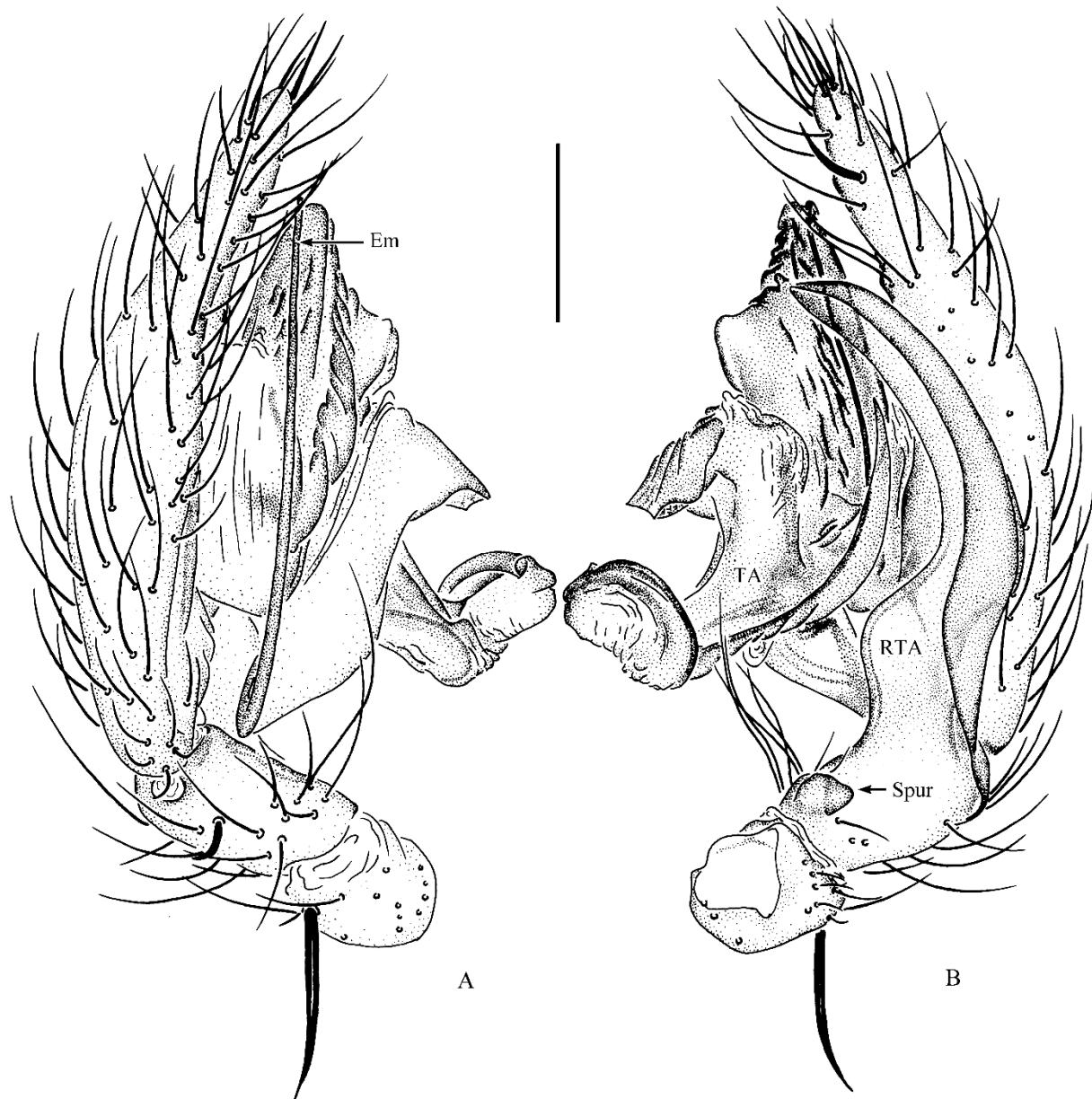


Figure 2. *Brommella baiseensis* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.2 mm.



Figure 3. *Brommella baiseensis* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

Labium length 0.15, width 0.20. Gnathocoxae length 0.35, width 0.25. Sternum length 0.70, width 0.68. Leg formula I-IV-II-III. Leg measurements: I 6.10 (1.75, 0.40, 1.65, 1.45, 0.85); II 4.60 (1.35, 0.40, 1.15, 1.05, 0.65); III 4.40 (1.20, 0.40, 0.90, 1.15, 0.75); IV 5.50 (1.55, 0.40, 1.35, 1.45, 0.75). Opisthosoma length 1.30, width 1.05. Opisthosoma pale, without any distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 2–3, 5). Cymbium 0.77 long. Apex of cymbium narrowed distally, ratio of cymbium length/width = 2.54. Surface of subtegulum wrinkled, black gray, prolaterally with a deep notch. Embolus filiform, originating at approximately 8:30 from tegulum. TA very strongly, spiraled, TA prolaterally broad, with slightly sclerotized edge. Base of tibia with a papillary spur, with several setae on it.

Female (one of the paratypes). Total body length 2.70 (Figs 6C–D). Prosoma length 1.40; width 0.85. Cephalic region width 0.50. Cephalic part slightly elevated. Eye diameters: ALE 0.08, PLE 0.09, PME 0.07. Eye region length 0.16, width 0.34. Eye interdistances: ALE–PLE 0.01, PLE–PME 0.04, PME–PME 0.07, ALE–ALE 0.09. Clypeus height 0.12. Chelicerae length 0.48, width 0.24. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth.

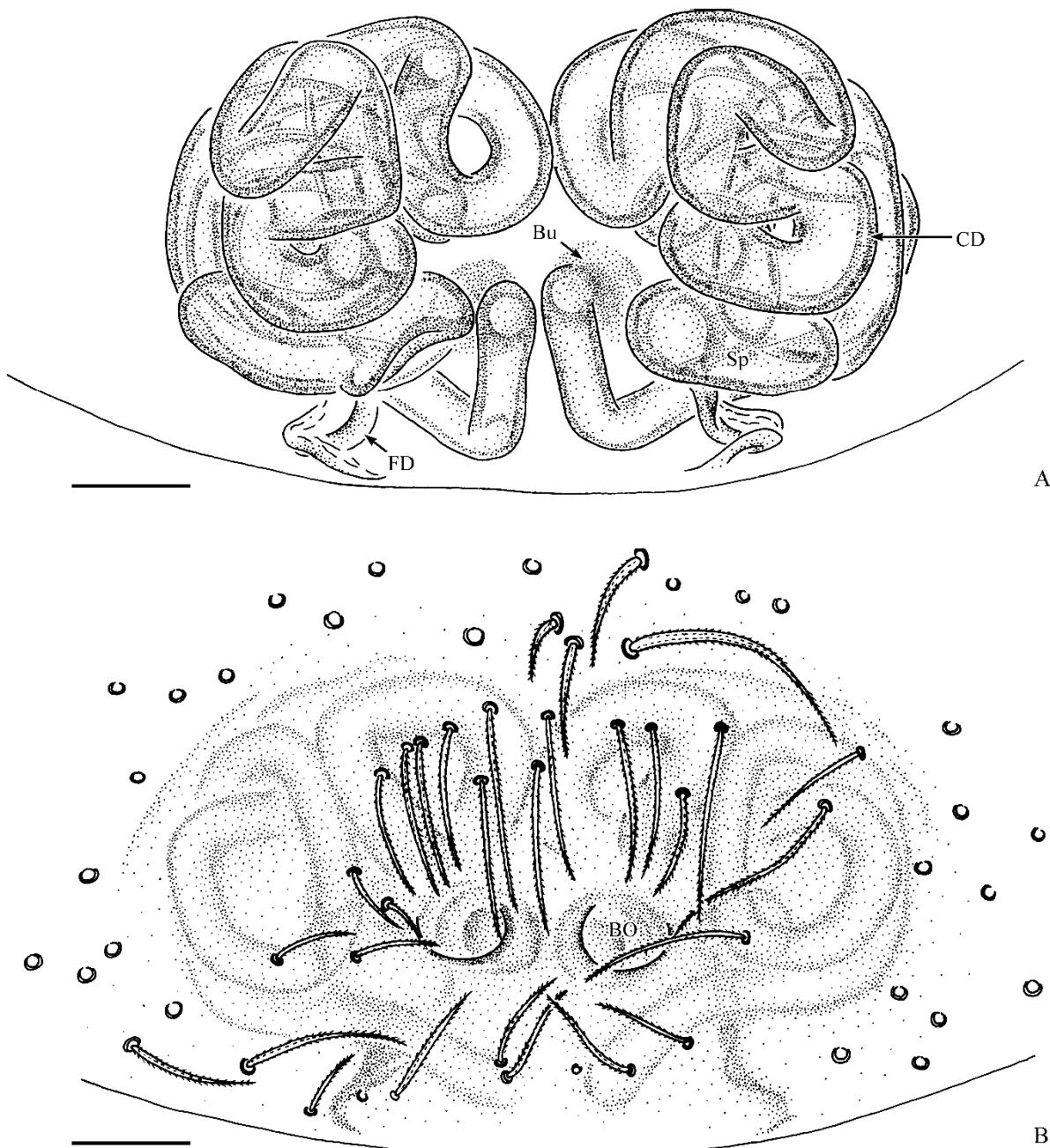


Figure 4. *Brommella baiseensis* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.05 mm.

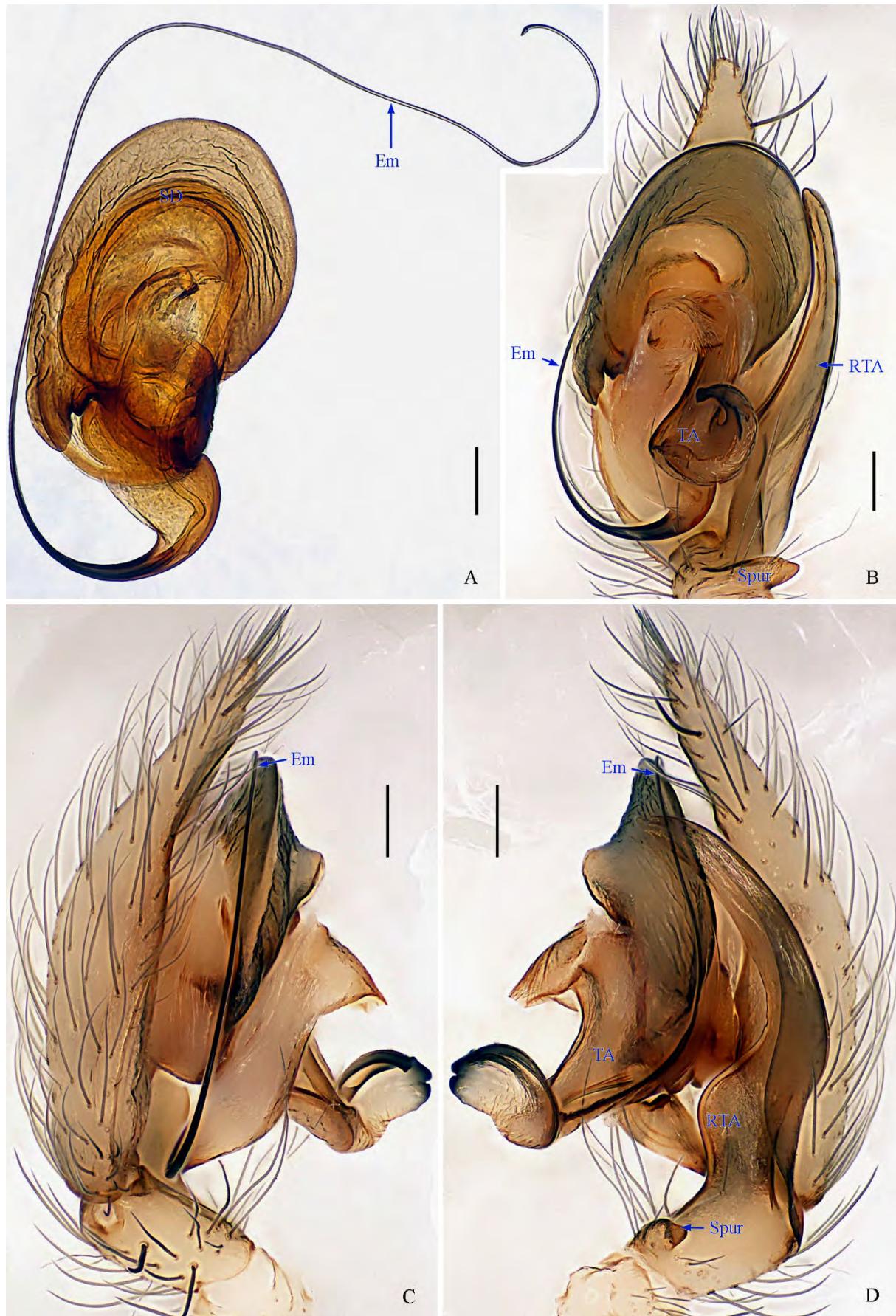


Figure 5. *Brommella baiseensis* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

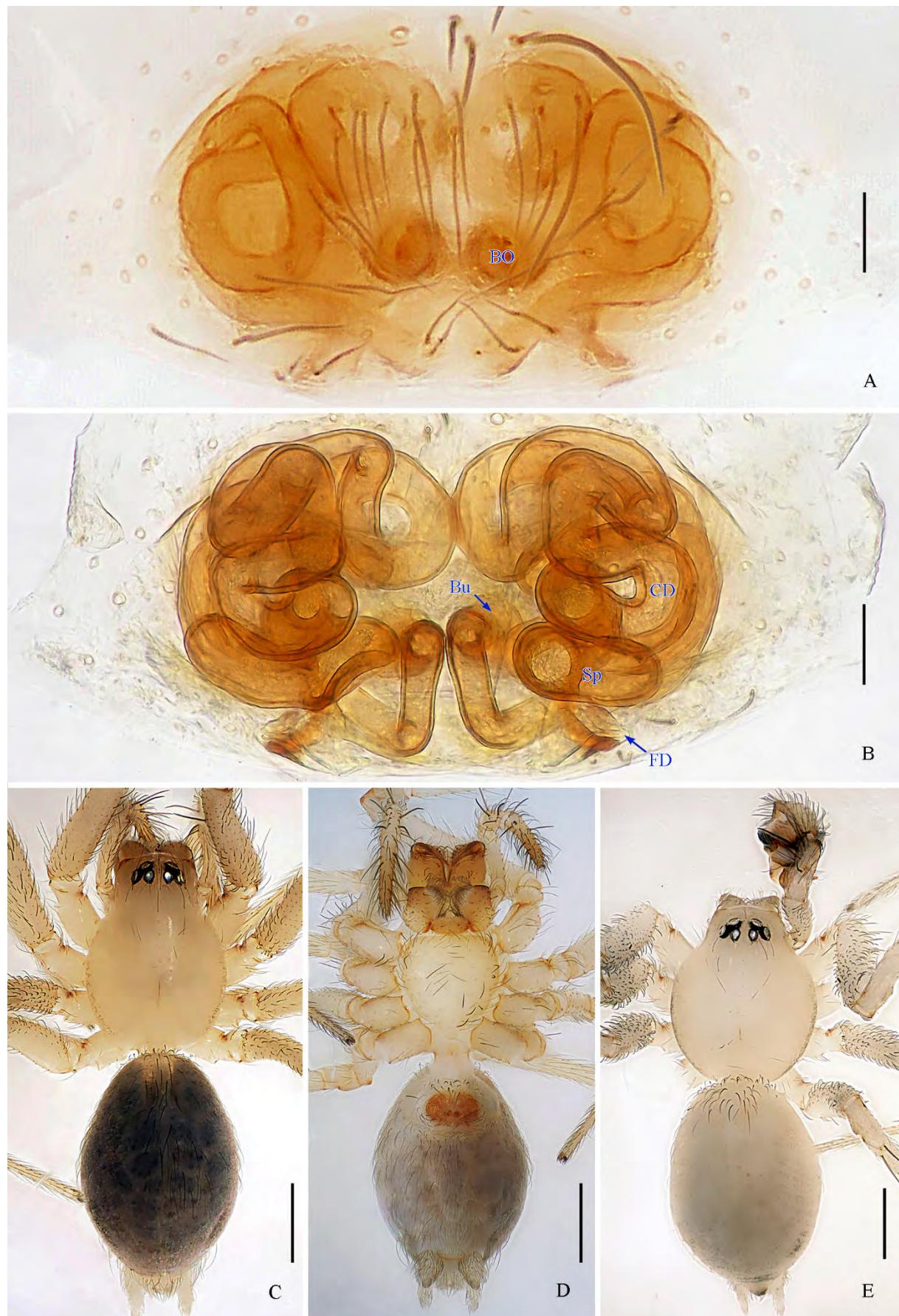


Figure 6. *Brommella baiseensis* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–E=0.5 mm.

Labium length 0.14, width 0.24. Gnathocoxae length 0.34, width 0.20. Sternum length 0.70, width 0.64. Leg formula I-IV-II-III. Leg measurements: I 5.50 (1.60, 0.45, 1.45, 1.30, 0.70); II 4.25 (1.30, 0.40, 0.95, 1.00, 0.60); III 3.85 (1.15, 0.35, 0.85, 0.95, 0.55); IV 4.78 (1.40, 0.40, 1.13, 1.20, 0.65). Ratio CI/Met IV=0.14, with 11 setae. Opisthosoma length 1.35, width 0.95.

Epigynum (Figs 4, 6A–B) 0.32 wide. BO round, relatively large. Copulatory ducts coiled in circular windings (ventral view). Bursae slightly enlarged, not fused. Copulatory ducts extremely long and exceedingly convoluted (Fig. 4A). Spermathecae small, transversely swollen.

Variation. Total body length: males 2.65–3.00 ( $n=4$ ), females 2.30–2.80 ( $n=9$ ).

Distribution. Known only from the type locality (Fig. 97).

***Brommella casseabri* Li, sp. nov. (Figs 7–8, 97)**

Type material. Holotype. Female, China, Guangxi, Guilin City, Xing'an County, Dayan Village, Dayan Cave, 25°34.263'N, 110°36.594'E, elev. 355 m, 12 July 2009, C. Wang & Z. Yao leg., deposited in IZCAS. Paratype. 1 female, same data as holotype, deposited in IZCAS.

Etymology. The specific name is derived from abbreviation of the Southeast Asia Biodiversity Research Institute, Chinese Academy of Sciences (CAS-SEABRI); noun in apposition. The name is dedicated to its three-part mission, viz., (a) Serve China's "the Silk Road Economic Belt and the 21st Century Maritime Silk Road" initiative; (b) Integrate efforts

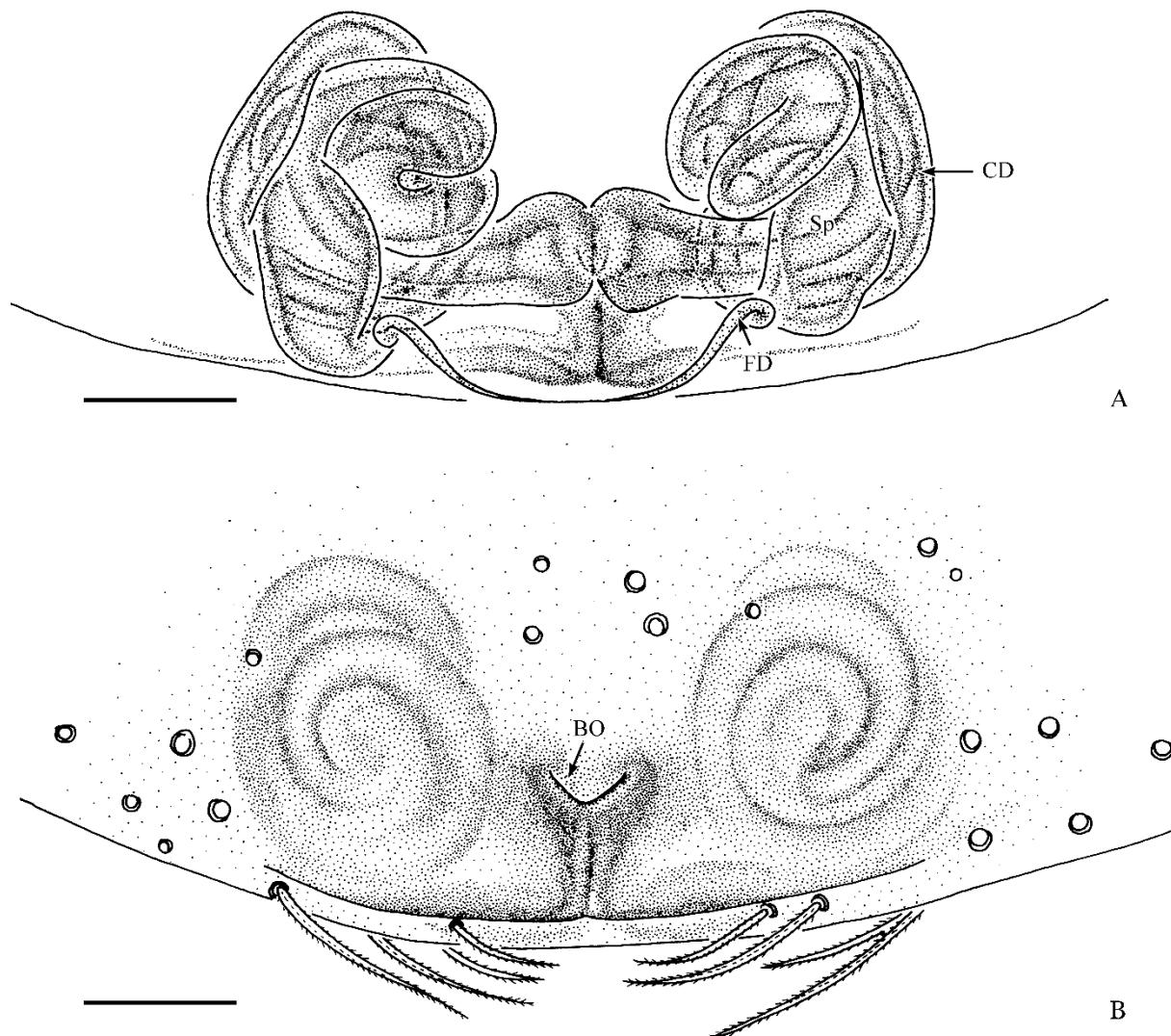


Figure 7. *Brommella casseabri* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.05 mm.

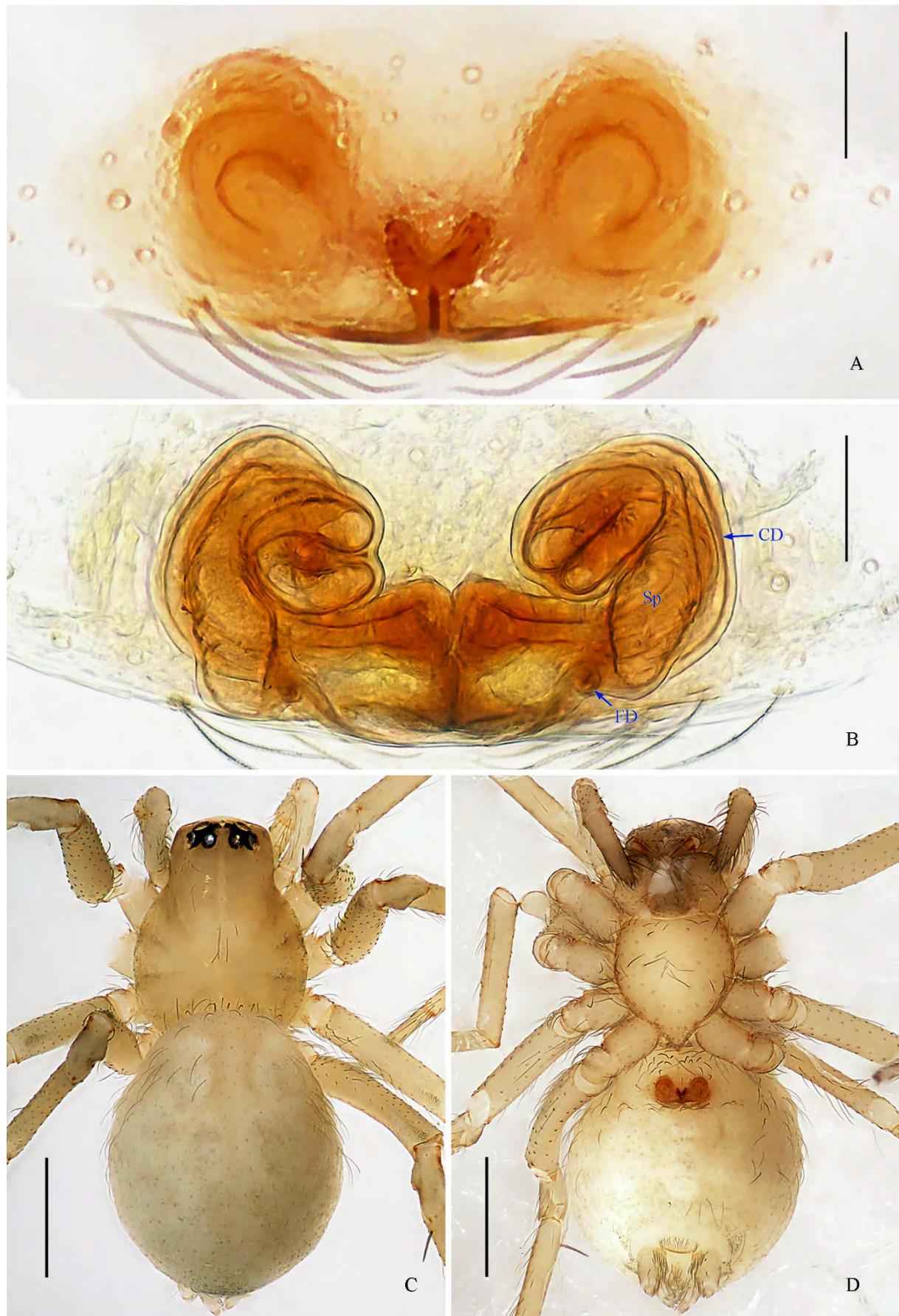


Figure 8. *Brommella casseabri* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–D=0.5 mm.

by CAS and international institutes to organize professional research groups and train researchers in Southeast Asian countries; and (c) Provide support to all domestic and international partners.

**Diagnosis.** Females of this new species are similar to *B. punctosparsa* (Song, Zhu & Chen, 1999: 363, figs 213K–N), but can be distinguished by the circinate copulatory ducts (copulatory ducts in circular coils in *B. punctosparsa*).

**Description.** Female (holotype). Total body length 2.00 (Figs 8C–D). Prosoma length 0.85, width 0.75. Cephalic region width 0.40. Carapace pyriform, dorsal shield of prosoma yellow-brown, cephalic region relatively flat, covered with several setae, fovea reduced, cervical groove indistinct. Six eyes, AME reduced to small pigment spots, all eyes white, encircled with black, PER slightly procurved from dorsal view. Eye sizes and interdistances: ALE 0.08, PLE 0.08, PME 0.06; ALE–ALE 0.10, ALE–PLE 0.01, PME–PME 0.07, PME–PLE 0.03. Eye region length 0.15, width 0.26. Clypeus height 0.05. Chelicerae length 0.40, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 3 retromarginal teeth. Labium and gnathocoxae light brown, sternum yellow-brown. Labium length 0.11, width 0.18. Gnathocoxae length 0.18, width 0.15. Sternum length 0.54, width 0.52. Legs yellow-brown. Leg formula I-IV-II-III. Leg measurements: I 3.48 (1.00, 0.33, 0.95, 0.75, 0.45); II 3.03 (0.90, 0.33, 0.75, 0.65, 0.40); III 2.68 (0.75, 0.30, 0.60, 0.63, 0.40); IV 3.38 (1.00, 0.33, 0.85, 0.75, 0.45). Ratio CI/Met IV=0.44, with 9 setae. Opisthosoma length 1.25, width 1.00. Opisthosoma pale yellow, without distinct pattern. Cribellum narrow, undivided.

**Epigynum** (Figs 7, 8A–B). Width 0.23. Bursae reduced, strongly sclerotized. Spermathecae slightly swollen, almost straight (Figs 7A, 8B).

Male. Unknown.

**Variation.** Total body length: females 1.9–2.0 ( $n=2$ ).

**Distribution.** Known only from the type locality (Fig. 97).

### *Brommella chongzuoensis* Li, sp. nov. (Figs 9–10, 97)

**Type material.** Holotype. Female, China, Guangxi, Chongzuo City, Fusui County, Changping Town, Hengfeng Village, cave without name, 22°42.887'N, 107°50.206'E, elev. 99 m, 12 July 2011, X. Wang leg., deposited in IZCAS.

**Etymology.** The specific name refers to the type locality; adjective.

**Diagnosis.** Females of this new species are similar to *B. dolabrata* Li, sp. nov. (Figs 13, 15A–D), but can be distinguished by the quadrate BO (oval in *B. dolabrata* Li, sp. nov.), and the two coils of copulatory duct of equal thickness (slender copulatory duct coiled around a section of much thicker copulatory duct in *B. dolabrata* Li, sp. nov.).

**Description.** Female (holotype). Total length 2.65 (Figs 10C–D). Prosoma length 1.25, width 0.95. Cephalic region width 0.53. Carapace pyriform, dorsal shield of prosoma yellow-brown, with relatively flat cephalic area, prosoma margin with several dark spots. Fovea reduced. Cervical groove indistinct. Eight eyes, all eyes white, encircled with black. Eye sizes and interdistances: AME 0.02, ALE 0.09, PLE 0.09, PME 0.07; AME–AME 0.02, AME–ALE 0.01, ALE–PLE 0.03, PLE–PME 0.04, PME–PME 0.08, ALE–ALE 0.09. Eye region length 0.12, width 0.35. Clypeus height 0.11. Chelicerae length 0.45, width 0.24, with distinct lateral condyles, 3 promarginal and 4 retromarginal teeth. Chelicerae, labium and gnathocoxae light brown, sternum yellow. Labium length 0.15, width 0.24. Gnathocoxae length 0.38, width 0.24. Sternum length 0.71, width 0.63. Legs yellow. Leg formula I-IV-II-III. Leg measurements: I 5.40 (1.55, 0.45, 1.45, 1.25, 0.70); II 4.20 (1.25, 0.40, 1.00, 0.95, 0.60); III 3.60 (1.05, 0.40, 0.75, 0.85, 0.55); IV 4.75 (1.40, 0.40, 1.15, 1.15, 0.65). Ratio CI/Met IV=0.33, with 14 setae. Opisthosoma length 1.70, width 1.25. Opisthosoma pale, with several black spots. Cribellum narrow, undivided.

**Epigynum** (Figs 9, 10A–B). Width 0.53. BO large, nearly squared, their sclerotized rims convex relative to centre of epigynum, upper margin heavily sclerotized. Copulatory ducts slender, loosely doubled coiling as spring. Spermathecae large, ovate. Fertilization ducts long, medially attached at base of spermathecae.

Male. Unknown.

**Distribution.** Known only from the type locality (Fig. 97).

### *Brommella dolabrata* Li, sp. nov. (Figs 11–15, 97)

**Type material.** Holotype. Male, China, Guangxi, Yulin City, Luchuan County, Longzhu Scenic Spot, Longzhu Cave, 22°34.529'N, 110°13.932'E, elev. 94 m, 13 August 2009, C. Wang & Z. Yao leg., deposited in IZCAS. Paratypes. 4 males, 13 females, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is derived from the Latin word “*dolabratus*”, meaning “shaped like an ax”, and refers to the spur at the base of the male palpal tibia with a broad edge; adjective.

**Diagnosis.** The male of this new species closely resembles those of *B. spirula* Li, sp. nov. (Figs 40–44), but can be distinguished by the relatively straight apophysis (hooked in *B. spirula* Li, sp. nov.), the spur with broad tip (hooked and

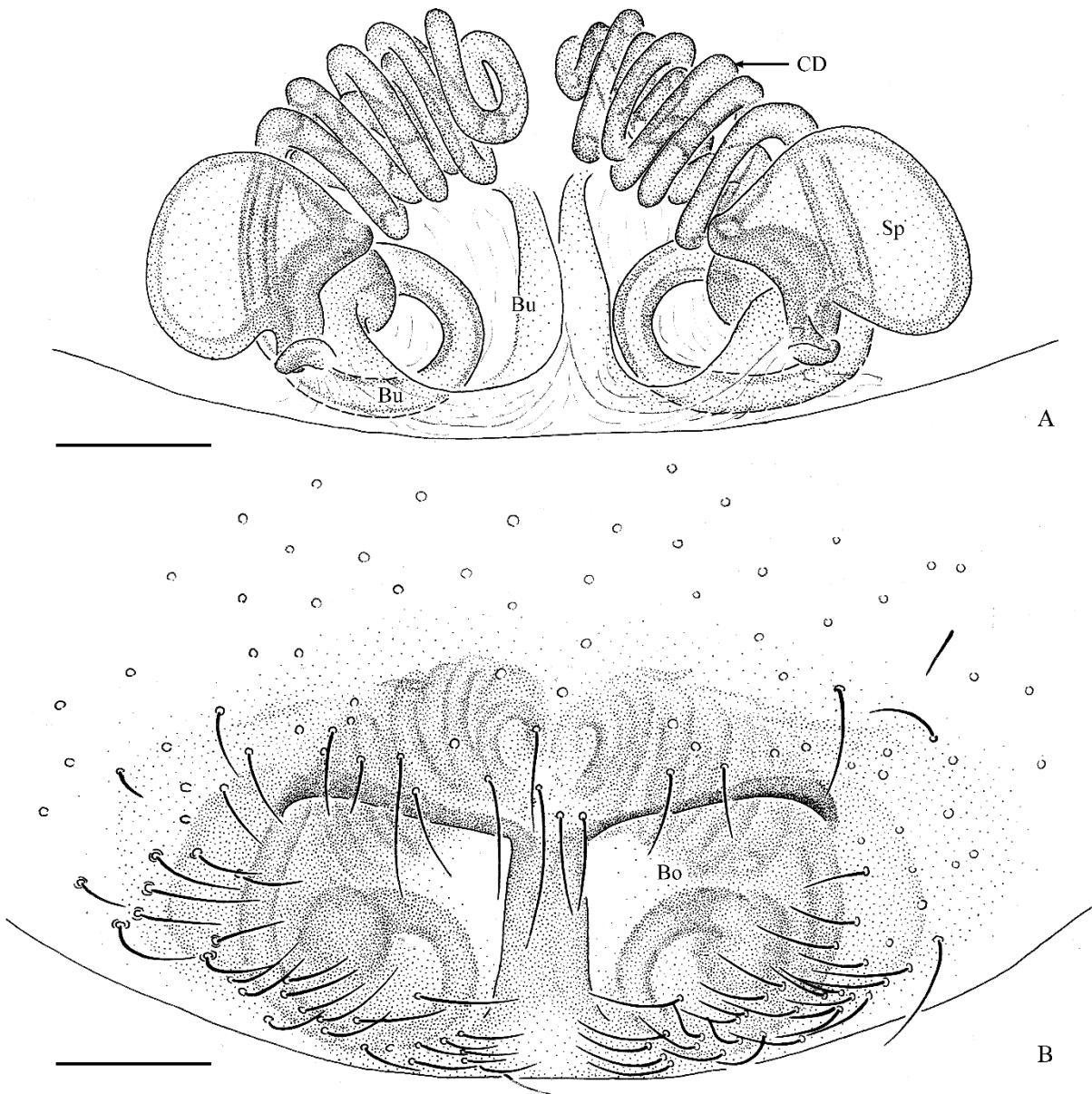


Figure 9. *Brommella chongzuoensis* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.1 mm.

with a pointed end in *B. spirula* Li, sp. nov.). Females of this new species appear almost identical with *B. chongzuoensis* Li, sp. nov. (Figs 9–10), but can be distinguished by the concave sclerotized rims of bursae towards the centre of epigynum (convex relative to centre of epigynum in *B. chongzuoensis* Li, sp. nov.), the thick and relatively straight copulatory duct joining the spermathecae (slender and coiled copulatory duct joining the spermathecae in *B. chongzuoensis* Li, sp. nov.), and the reniform spermathecae (ovate in *B. chongzuoensis* Li, sp. nov.).

**Description.** Male (holotype). Total body length 2.24 (Fig. 15E). Prosoma length 1.10, width 0.95. Cephalic region width 0.43. Cephalic part flat, yellow, covered with several setae. Thoracic part light brown, fovea reduced. Eight eyes, PER procured as seen from in front, AME smallest. All eyes dark, encircled with black. Eye diameters: AME 0.03, ALE 0.07, PLE 0.09, PME 0.07. Eye region length 0.19, width 0.38. Eye interdistances: AME-AME 0.01, AME-ALE 0.01, ALE-PLE 0.02, PLE-PME 0.05, PME-PME 0.07, AME-PME 0.08. Clypeus height 0.12. Chelicerae length 0.43, width 0.20. Chelicerae with distinct lateral condyles, 3 (2 large 1 small) promarginal and 4 retromarginal teeth. Chelicerae, labium and gnathocoxae brown, sternum light brown. Labium length 0.16, width 0.24. Gnathocoxae length 0.38, width 0.23. Sternum length 0.75, width 0.52. Legs light brown. Leg formula I-IV-II-III. Leg measurements: I 6.31 (1.76, 0.45, 1.70, 1.50, 0.90); II 5.14 (1.45,

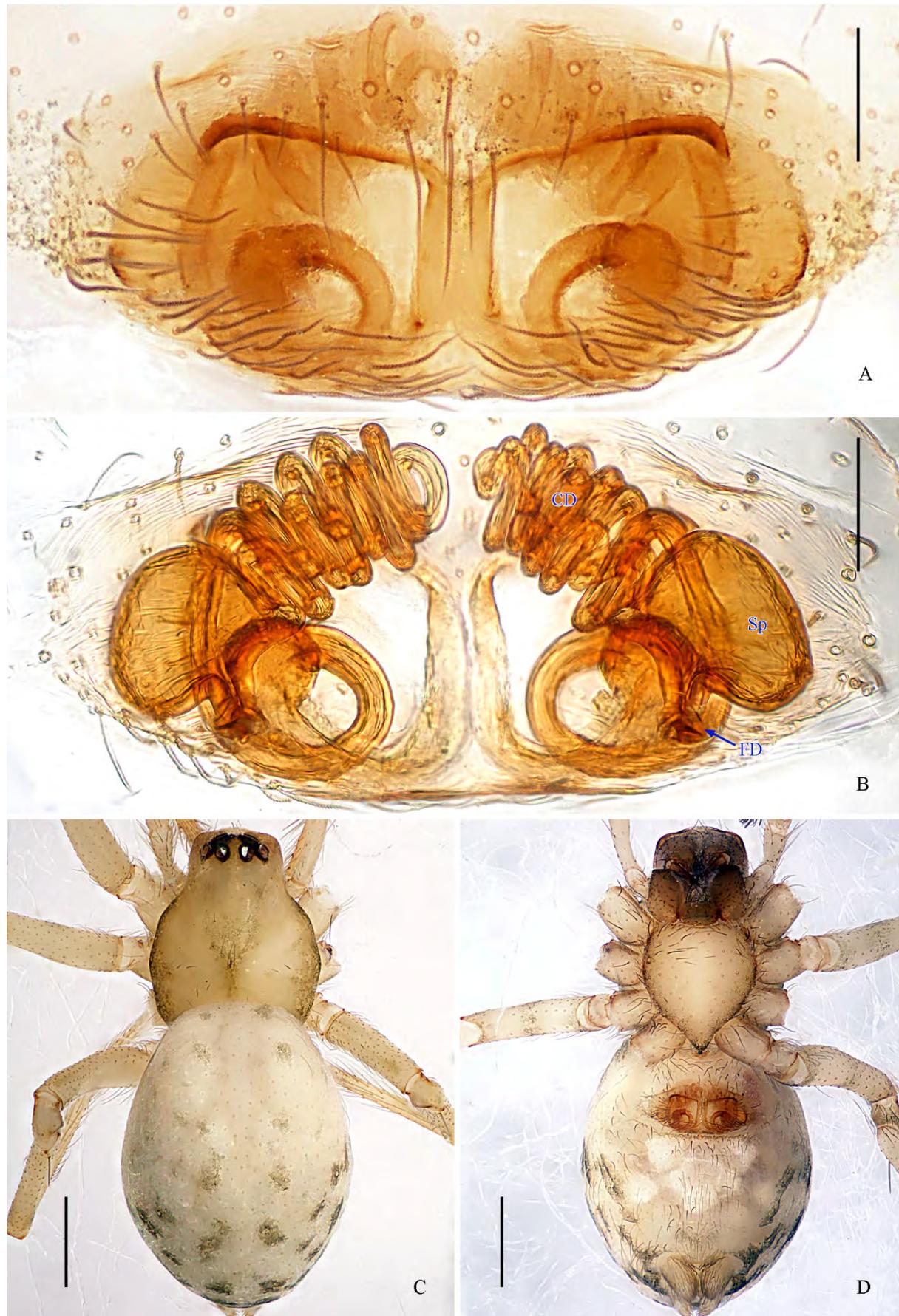


Figure 10. *Brommella chongzuoensis* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–D=0.5 mm.

0.43, 1.28, 1.23, 0.75); III 4.61 (1.30, 0.38, 1.10, 1.15, 0.68); IV 5.80 (1.60, 0.35, 1.40, 1.60, 0.85). Ratio Cl/Met IV=0.18, with 5 setae. Opisthosoma length 1.25, width 0.98. Opisthosoma pale-yellow, without distinct pattern. Spinnerets yellow-brown.

Pedipalpus (Figs 11–12, 14). Cymbium 0.75 long. Embolus slender, ribbon shaped, originated at approximately 6 o'clock position. TA tip boat head shaped. Dorsal of TA tip with large, relatively straight apophysis. TA retrolateral large, with a single fold, and with 4 setae. Spur with broad tip.

Female (one of the paratypes). Total body length 3.10 (Figs 15C–D). Prosoma length 1.31, width 0.93. Cephalic region width 0.58. Eye sizes and interdistances: AME 0.04, ALE 0.08, PLE 0.09, PME 0.07; AME-AME 0.01, AME-ALE 0.01, ALE-PLE 0.03, PLE-PME 0.05, PME-PME 0.07, AME-PME 0.08. Eye region length 0.20, width 0.38. Clypeus height 0.12. Chelicerae length 0.53, width 0.25. Chelicerae with distinct lateral condyles, 3 promarginal and 4 retromarginal teeth. Labium length 0.20, width 0.26. Gnathocoxae length 0.44, width 0.24. Sternum length 0.75, width 0.69. Leg formula I-IV-II-III. Leg measurements: I 6.48 (1.80, 0.48, 1.80, 1.55, 0.85); II 4.88 (1.40, 0.45, 1.23, 1.15, 0.65); III 4.52 (1.25, 0.40, 1.38, 0.87, 0.62); IV 5.46 (1.49, 0.40, 1.40, 1.40, 0.77). Ratio Cl/Met IV=0.25, with 11 setae. Opisthosoma length 1.70, width 1.40. Opisthosoma white, without distinct pattern.



Figure 11. *Brommella dolabrata* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

Epigynum (Figs 13, 15A–B). Width 0.51. Bursae large, located posteriorly, their sclerotized rims concave relative to centre of epigynum. Bursa developed. Slender copulatory ducts loosely coiled along the thick and relatively straight copulatory, the thick copulatory duct joining the reniform spermathecae. Fertilization duct internally attached at base of spermathecae.

Variation. Total body length: males 2.10–3.10 ( $n=5$ ), females 2.51–3.50 ( $n=13$ ).

Distribution. Known only from the type locality (Fig. 97).

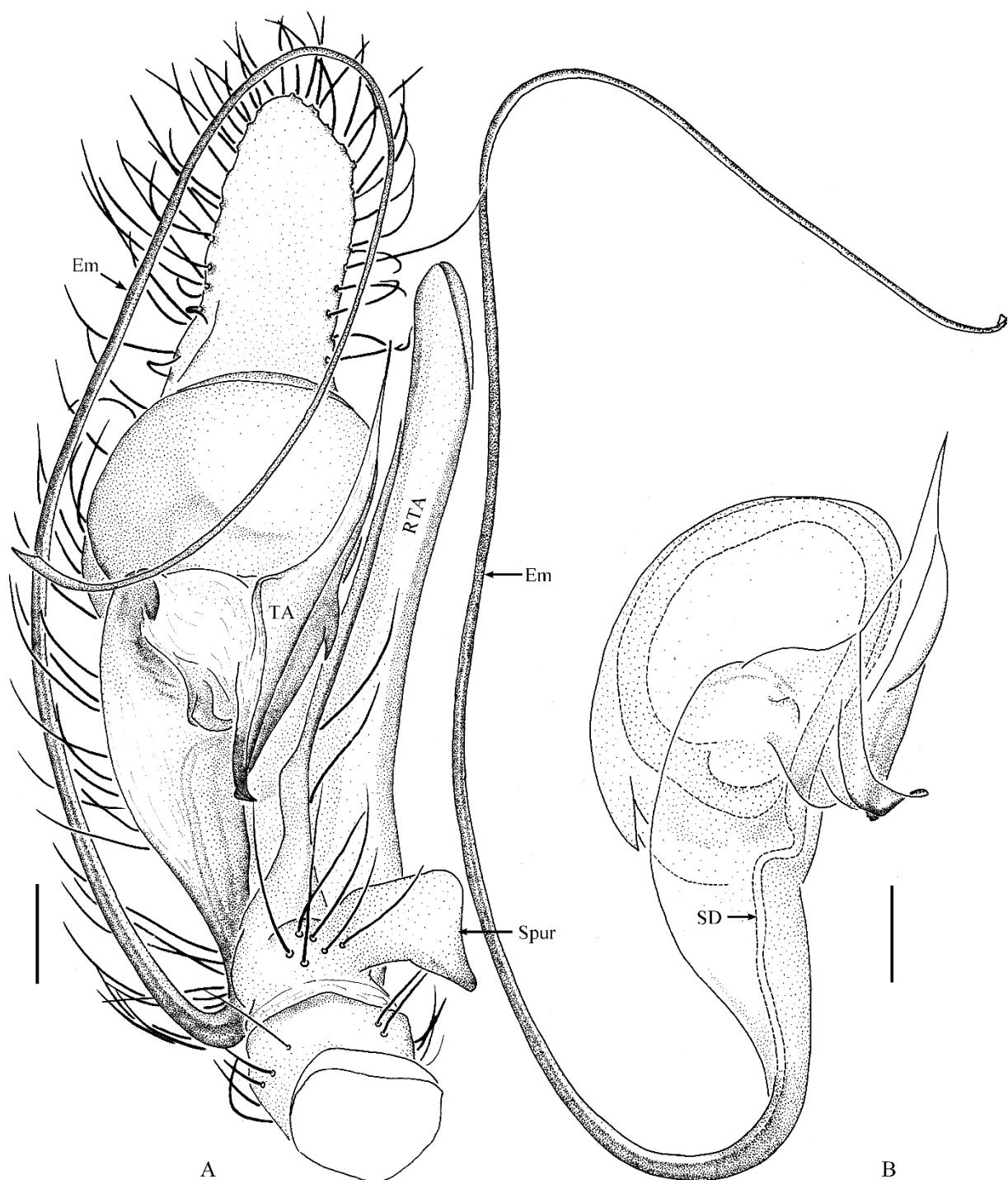


Figure 12. *Brommella dolabrata* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

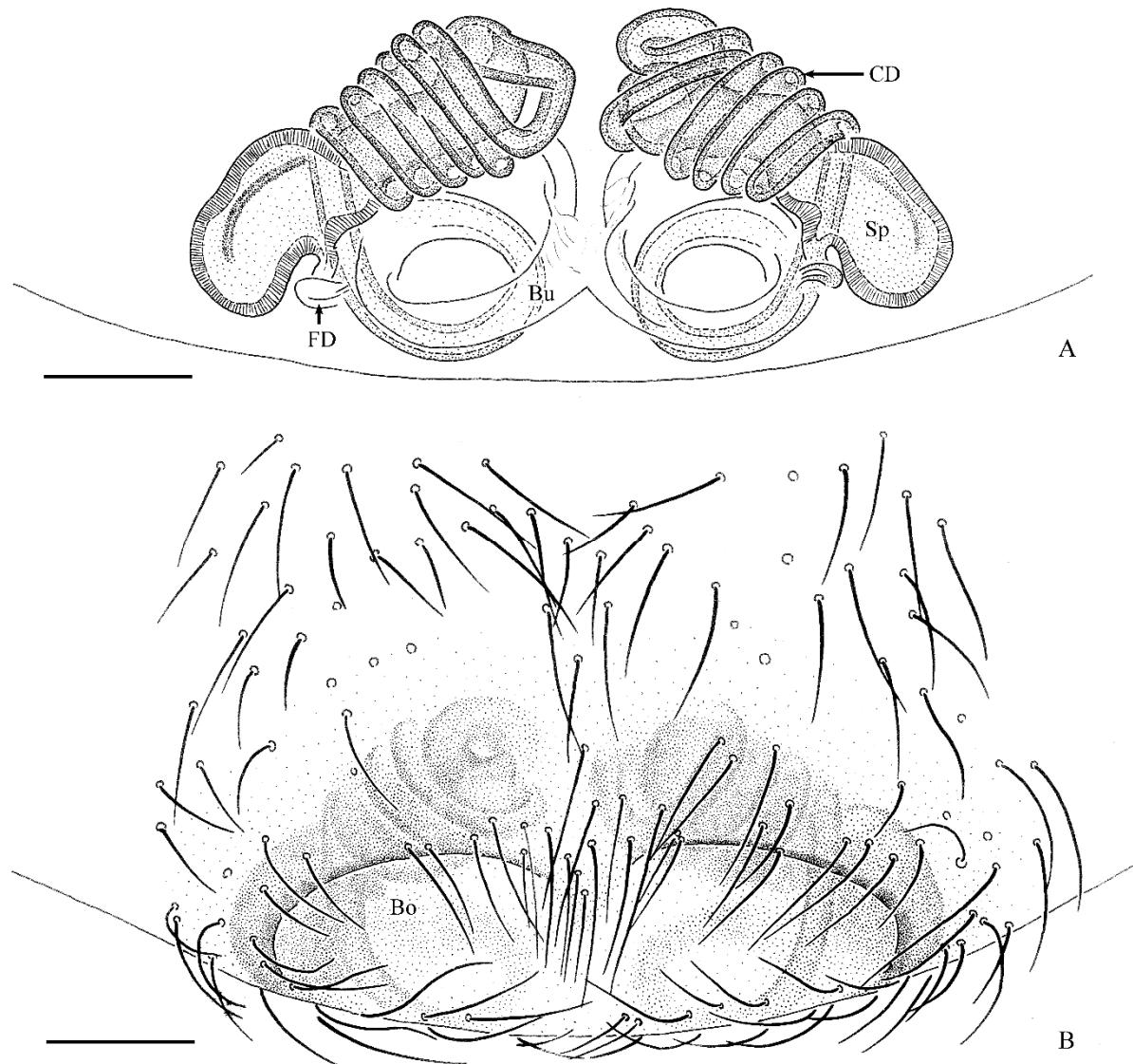


Figure 13. *Brommella dolabrata* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.1 mm.

***Brommella funaria* Li, sp. nov. (Figs 16–20, 97)**

Type material. Holotype. Male, China, Guangxi, Yizhou City, Yankou Village, Xiannüyan Cave, 24°29.319'N, 108°34.205'E, elev. 205 m, 28 July 2009, C. Wang & Z. Yao leg., deposited in IZCAS. Paratypes. 6 males, 7 females, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is derived from the Latin word “*funarius*”, meaning “of a rope”, and refers to the shape of the copulatory ducts; adjective.

**Diagnosis.** Males of this new species are similar to *B. yizhouensis* Li, sp. nov. (Figs 57–61), but can be distinguished by the 8-o’clock position of the base of the embolus (originating approximately at the 10-o’clock position in *B. yizhouensis* Li, sp. nov.). Females of this new species are similar to *B. tongyanfengi* Li, sp. nov. (Figs 45–49), but can be distinguished by the copulatory ducts twisted as two short ropes in ventral view (copulatory ducts twisted loosely and irregularly in *B. tongyanfengi* Li, sp. nov.).

**Description.** Male (holotype). Total body length 1.90 (Fig. 20E). Prosoma length 0.90, width 0.70. Cephalic region width 0.45. Dorsal shield of prosoma yellow, cephalic region relatively flat, covered with several setae. Fovea reduced. Cervical groove indistinct. Six eyes, AME reduced to small pigment spots, all eyes white, encircled with black. Eye sizes and interdistances: ALE 0.07, PLE 0.07, PME 0.05; ALE-PLE 0.01, PLE-PME 0.03, PME-PME 0.06, ALE-ALE 0.08. Eye

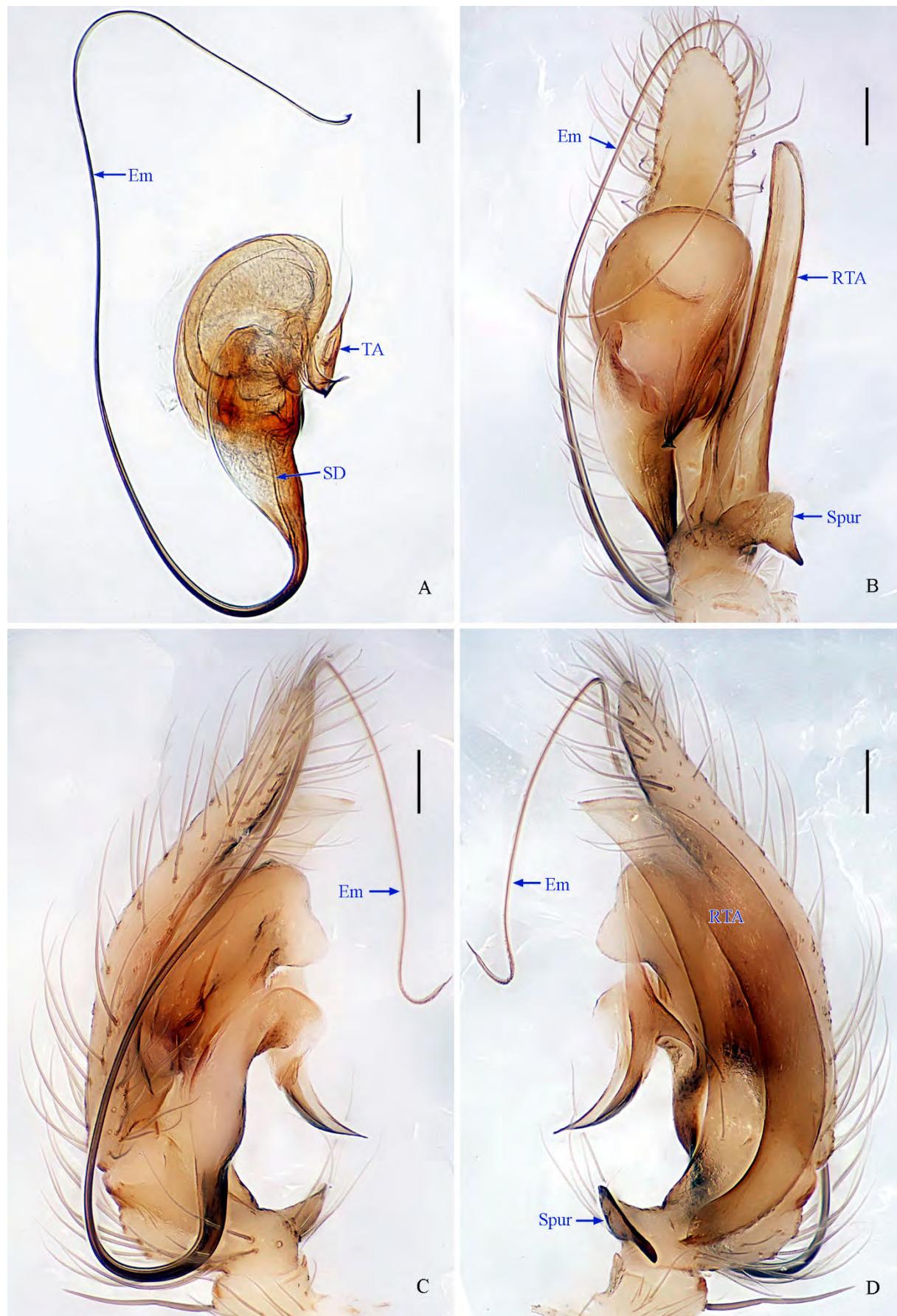


Figure 14. *Brommella dolabrata* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

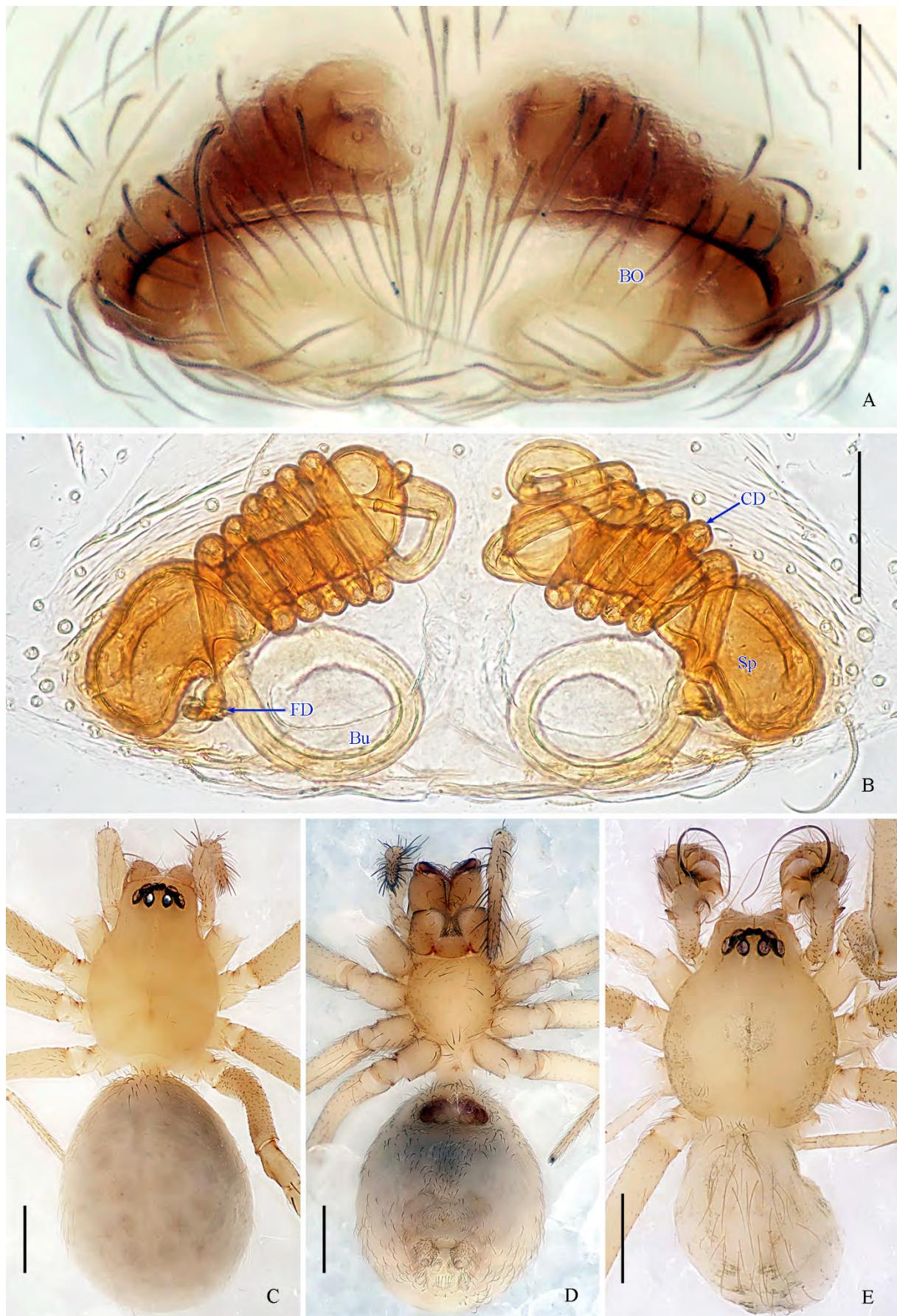


Figure 15. *Brommella dolabrata* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–D=0.5 mm.

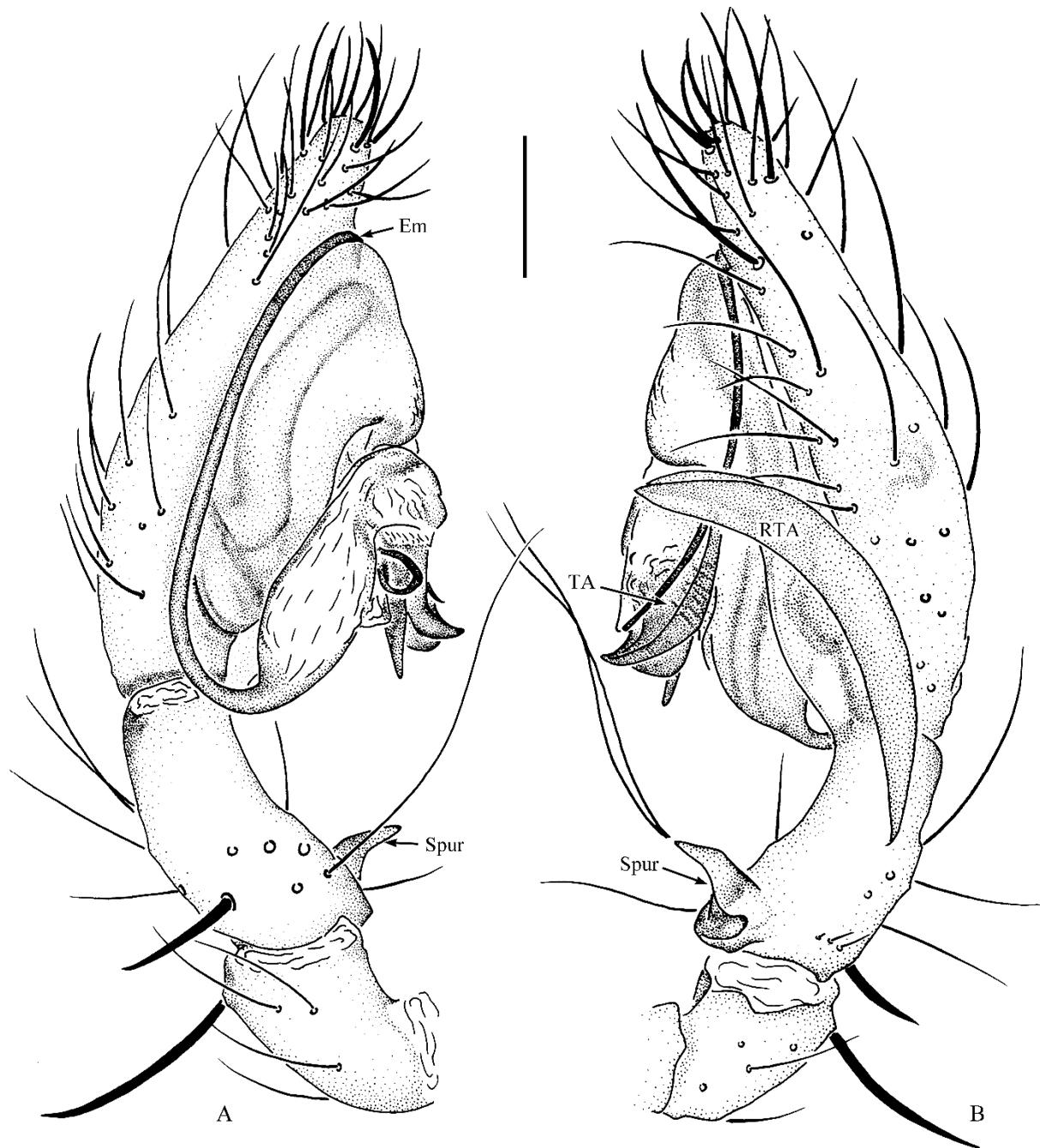


Figure 16. *Brommella funaria* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

region length 0.17, width 0.32. Clypeus height 0.10. Chelicerae length 0.40, width 0.19. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Labium and gnathocoxae yellow-brown; sternum yellow. Labium length 0.13, width 0.18. Gnathocoxae length 0.31, width 0.18. Sternum length 0.58, width 0.53. Legs yellow. Leg formula I-IV-II-III. Leg measurements: I 4.41 (1.25, 0.33, 1.25, 0.93, 0.65); II 3.63 (1.03, 0.30, 0.85, 0.85, 0.60); III 3.29 (0.90, 0.33, 0.78, 0.75, 0.53); IV 4.11 (1.20, 0.33, 1.00, 1.00, 0.58). Ratio Cl/Met IV=0.38, with 7 setae. Opisthosoma length 0.95, width 0.68, white, without distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 16–17, 19). Cymbium 0.40 long. Embolus long, filiform, originating at approximately 7-o'clock position. TA prolatally short and simple. RTA large, simple, with a single fold. Base of tibia with a large bifurcated spur.

Female (one of the paratypes). Total body length 2.05 (Figs 20C–D). Prosoma length 0.90, width 0.65. Cephalic region width 0.40. Eye sizes and interdistances: ALE 0.06, PLE 0.07, PME 0.04; ALE-PLE 0.01, PLE-PME 0.03, PME-PME 0.06,

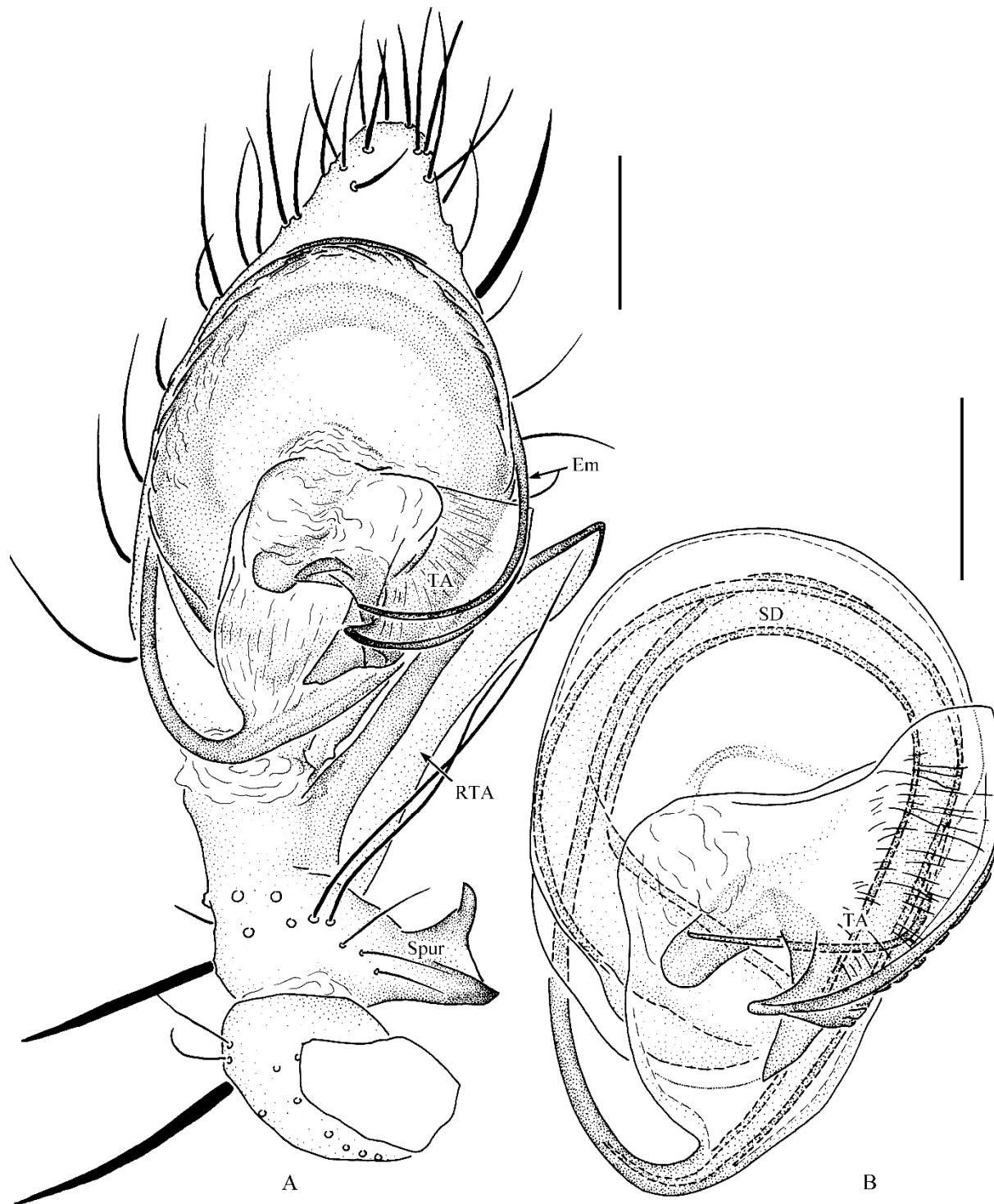


Figure 17. *Brommella funaria* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

ALE-ALE 0.09. Eye region length 0.15, width 0.27. Clypeus height 0.08. Chelicerae length 0.39, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 4 retromarginal teeth. Labium length 0.13, width 0.18. Gnathocoxae length 0.30, width 0.18. Sternum length 0.53, width 0.45. Leg formula I-IV-II-III. Leg measurements: I 3.88 (1.13, 0.35, 1.00, 0.85, 0.55); II 3.25 (1.00, 0.35, 0.75, 0.70, 0.45); III 2.80 (0.85, 0.25, 0.60, 0.65, 0.45); IV 3.66 (1.10, 0.30, 0.88, 0.88, 0.50). Ratio CI/Met IV=0.26, with 7 setae. Opisthosoma length 1.15, width 0.85, without distinct pattern.

Epigynum (Figs 18, 20A-B). Width 0.24. Bursae reduced. Copulatory ducts slender, twisted tightly as short ropes.

Spermathecae parts slightly swollen, S-shaped.

Variation. Total body length: males 1.6–1.9 ( $n=7$ ), females 1.80–2.50 ( $n=7$ ).

Distribution. Known only from the type locality (Fig. 97).

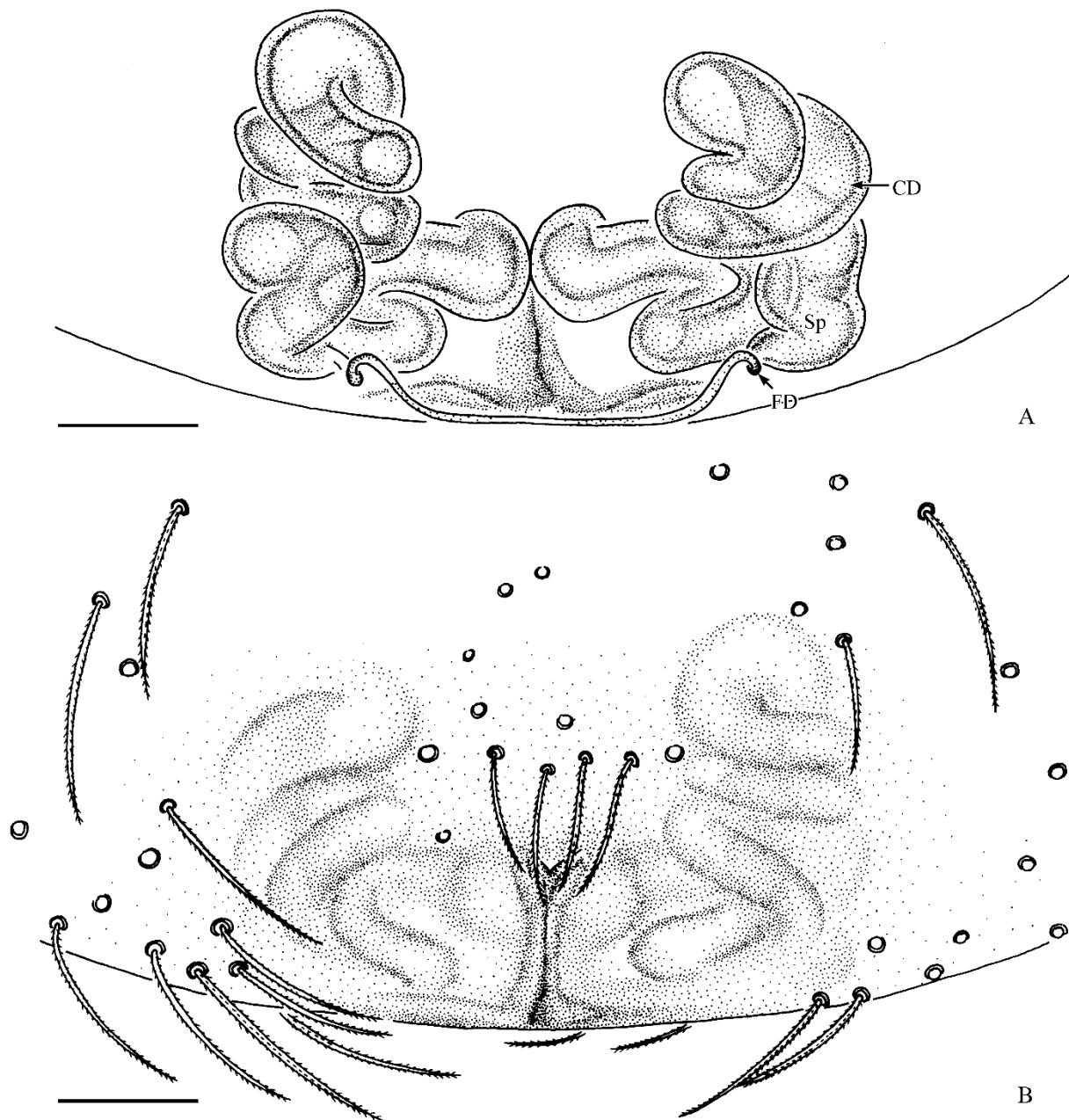


Figure 18. *Brommella funaria* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.1 mm.

#### *Brommella josephkohi* Li, sp. nov. (Figs 21–25, 97)

Type material. Holotype. Male, China, Guangxi, Nanning City, Wuming County, Yilingyan Cave, 23°02.374'N, 108°17.529'E, elev. 151 m, 19 October 2010, X. Wang & L. Lin leg., deposited in IZCAS. Paratypes. 7 males, 21 females, same data as holotype, deposited in IZCAS.

Etymology. The specific name is a patronym in honor of Joseph K. H. Koh from Singapore; noun in apposition. Joseph K. H. Koh is a pioneer researcher on spiders of Singapore.

Diagnosis. This new species is similar to *B. baiseensis* Li, sp. nov. (Figs 2–6), but can be distinguished by the presence of a folded, simple protrusion towards base of TA (with a branched apophysis towards base of TA in *B. baiseensis* Li, sp.

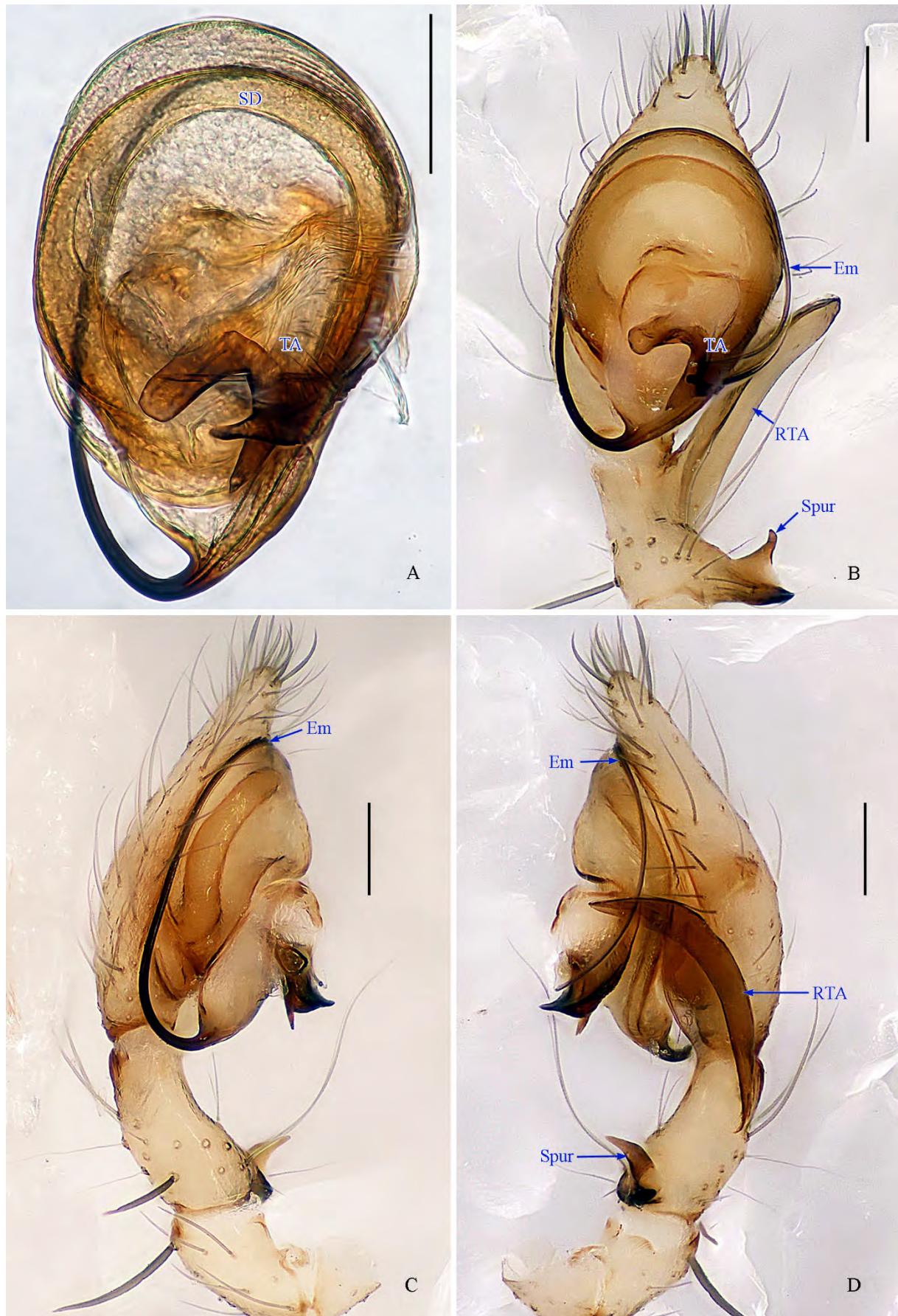


Figure 19. *Brommella funaria* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

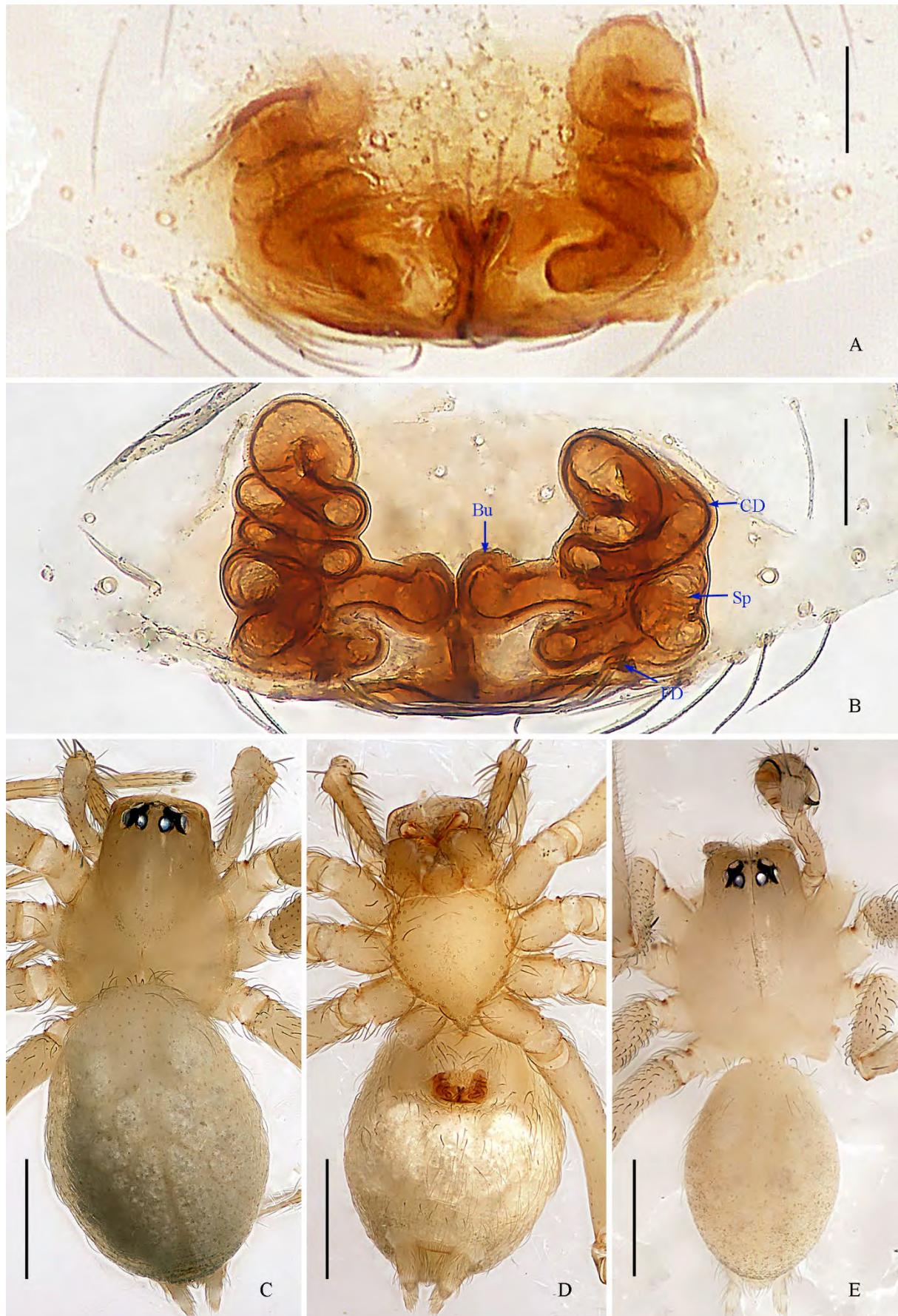


Figure 20. *Brommella funaria* Li, sp. nov. A–D. Paratype, female. E. holotype male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–E=0.5 mm.

**nov.**), TA prolaterally strongly sclerotized and slightly triangular (prolateral margin of the broad TA slightly sclerotized in *B. baiseensis* Li, **sp. nov.**), the hooked tibial spur (spur straight in *B. baiseensis* Li, **sp. nov.**), and the presence of a linguiform projection covering BO (BO exposed in *B. baiseensis* Li, **sp. nov.**).

Description. Male (holotype). Total body length 2.80 (Fig. 25F). Prosoma length 1.30, width 1.00. Cephalic region width 0.60. Carapace pyriform. Cephalic part flat, light brown, covered with several setae. Thoracic part light brown, fovea reduced, prosoma margin black to indistinct. Six eyes, AME absent, all eyes white, encircled with black. Eye diameters: ALE 0.10, PLE 0.10, PME 0.08. Eye interdistances: ALE-PLE 0.01, PLE-PME 0.04, PME-PME 0.08, ALE-ALE 0.08. Eye region length 0.20, width 0.37. Clypeus height 0.20. Chelicerae length 0.63, width 0.23. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Labium and gnathocoxae light brown; sternum yellow. Labium length 0.16, width 0.25. Gnathocoxae length 0.40, width 0.25. Sternum length 0.75, width 0.73. Leg formula I-IV-II-III. Leg measurements: I 5.85 (1.65, 0.50, 1.60, 1.35, 0.75); II 4.53 (1.25, 0.45, 1.15, 1.08, 0.60); III 4.06 (1.20, 0.35, 0.93, 1.00, 0.58); IV 5.30 (1.50, 0.40, 1.35, 1.35, 0.70). Ratio Cl/Met IV=0.33, with 9 setae. Opisthosoma length 1.55, width 1.15. Opisthosoma off-white, without distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 21–22, 24). Cymbium 1.04 long. Surface of subtegulum wrinkled, ash-black. Embolus filiform, originates at approximately 6-o'clock position. TA fold rugose, with a simple, wrinkled bump. TA very strongly spiraled, TA prolaterally not pointed, edge strongly sclerotized, somewhat triangular shaping. RTA simple, with a single fold, pointed distally. RTA proximally broad and distally narrow. Base of tibia with a hooked spur.

Female (one of the paratypes). Total body length 2.55 (Figs 25C–E). Prosoma length 1.10; width 0.90. Cephalic region



Figure 21. *Brommella josephkohi* Li, **sp. nov.**, holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.2 mm.

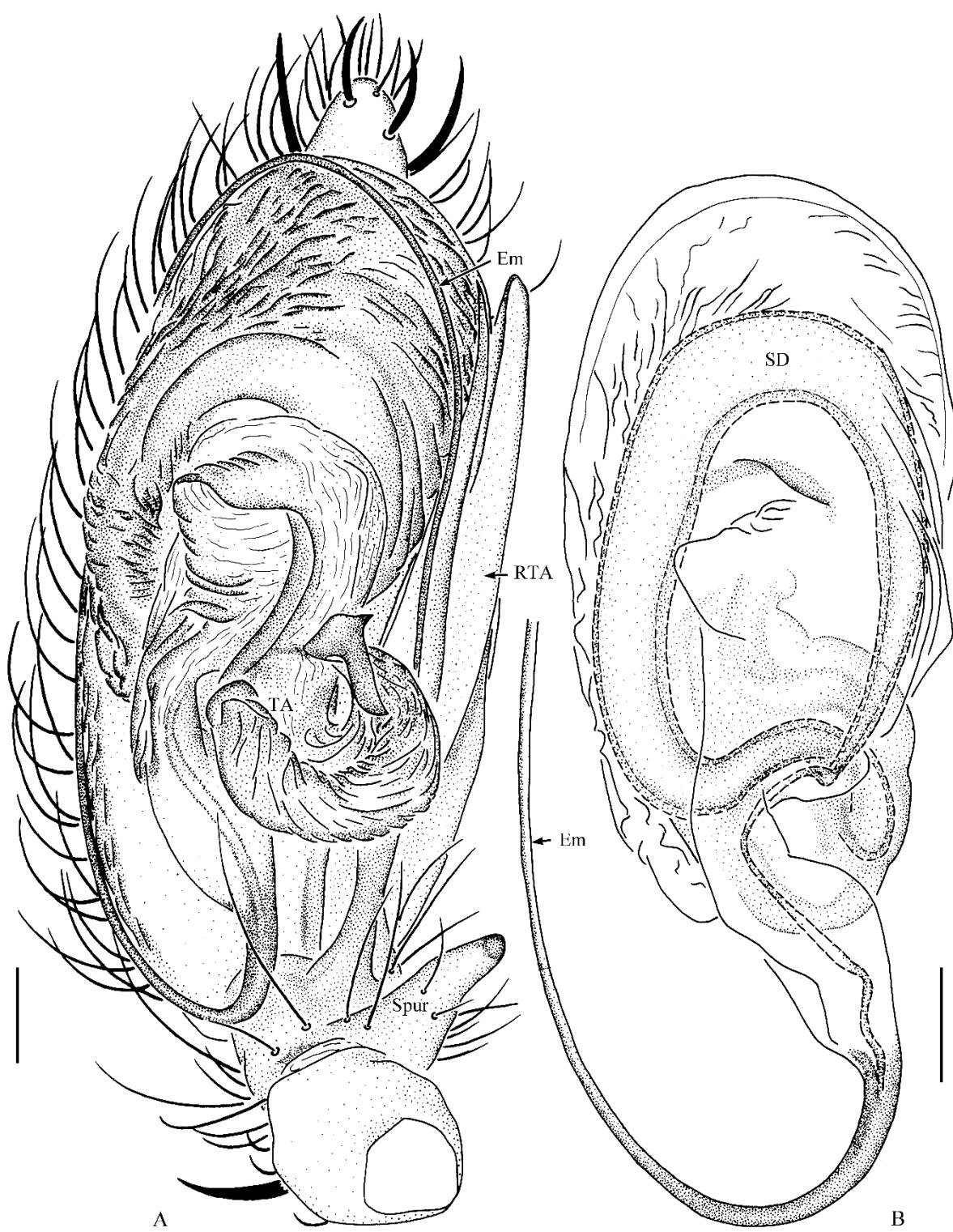


Figure 22. *Brommella josephkohi* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

width 0.53. Cephalic part slightly elevated. Eye diameters: ALE 0.07, PLE 0.09, PME 0.06. Eye region length 0.16, width 0.45. Eye interdistances: ALE-PLE 0.02, PLE-PME 0.03, PME-PME 0.08, ALE-ALE 0.09. Clypeus height 0.12. Chelicerae length 0.53, width 0.25. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Labium length 0.14, width 0.24. Gnathocoxae length 0.40, width 0.20. Sternum length 0.70, width 0.63. Leg formula I-IV-II-III. Leg measurements: I 4.53 (1.35, 0.40, 1.18, 1.00, 0.60); II 3.55 (1.05, 0.35, 0.85, 0.75, 0.55); III 3.20 (1.00, 0.30, 0.65, 0.75,

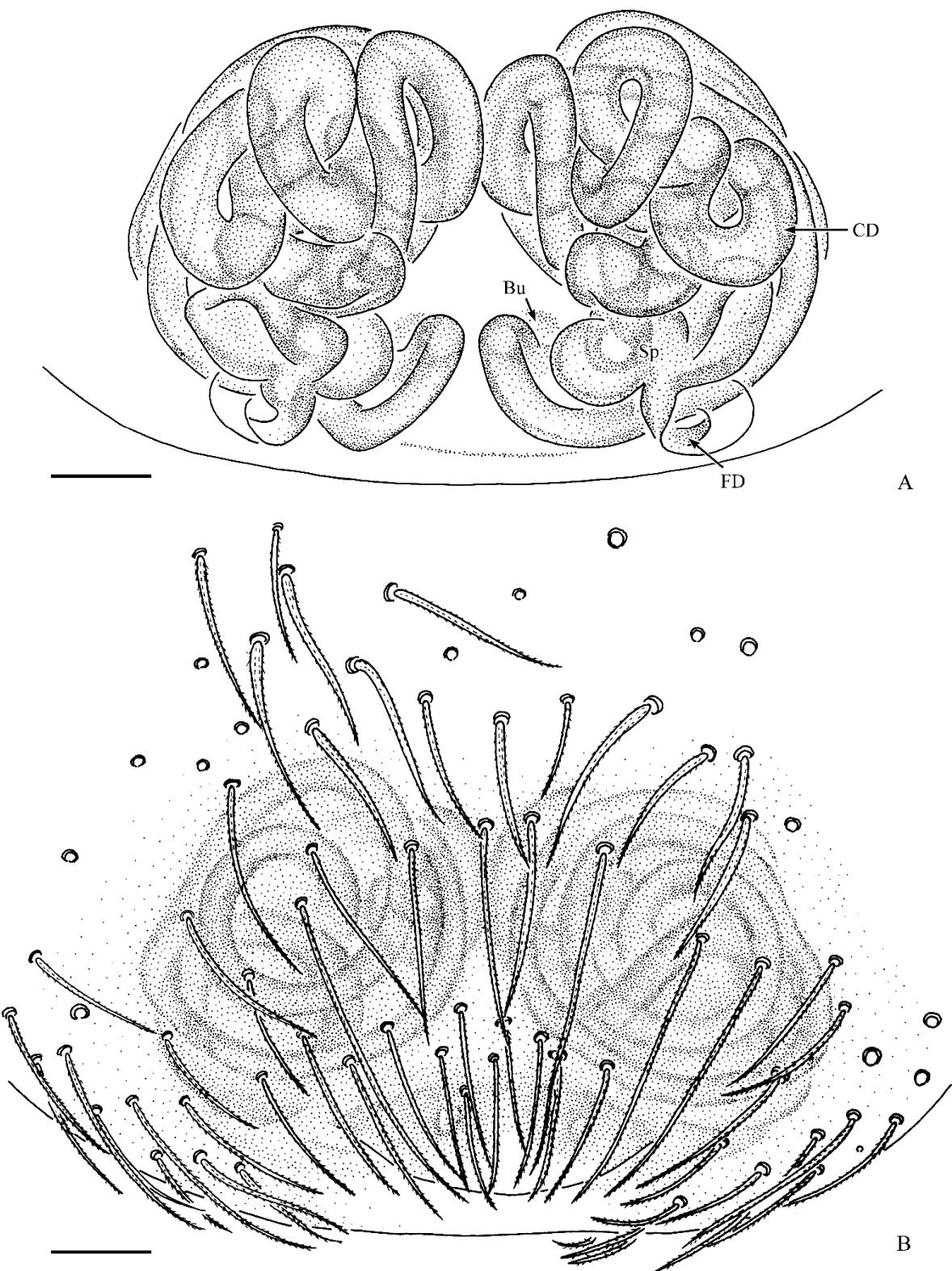


Figure 23. *Brommella josephkohi* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

0.50); IV 4.25 (1.25, 0.40, 1.00, 1.00, 0.60). Ratio Cl/Met IV = 0.42, with 10 setae. Abdomen length 1.45, width 1.05. Opisthosoma beige, with row of anchor shaped pattern.

Epigynum (Figs 23, 25A–B). Width 0.36. Atrium situated posteriorly on epigynal ventral plate, covered by a linguiform

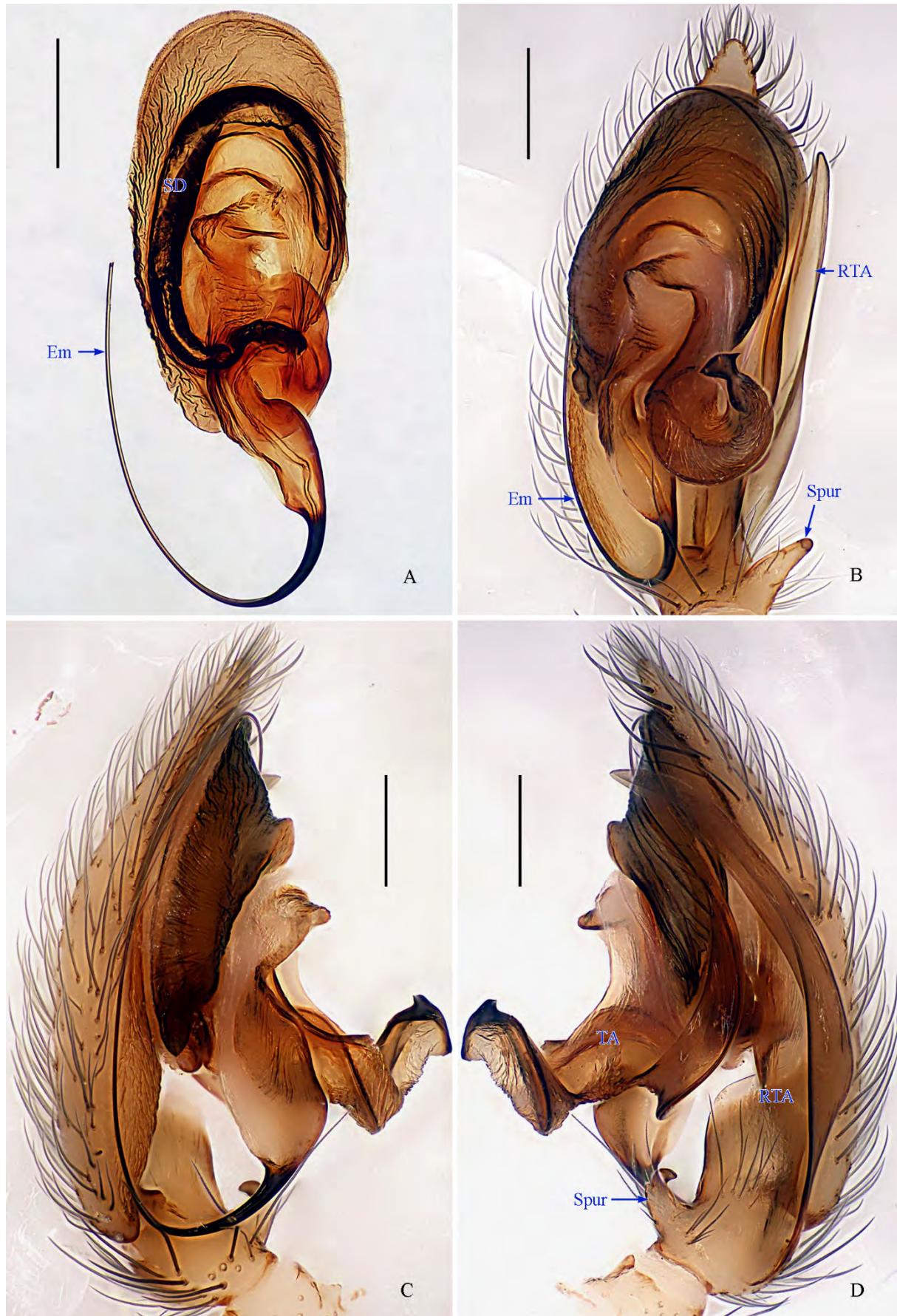


Figure 24. *Brommella josephkohi* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.2 mm.

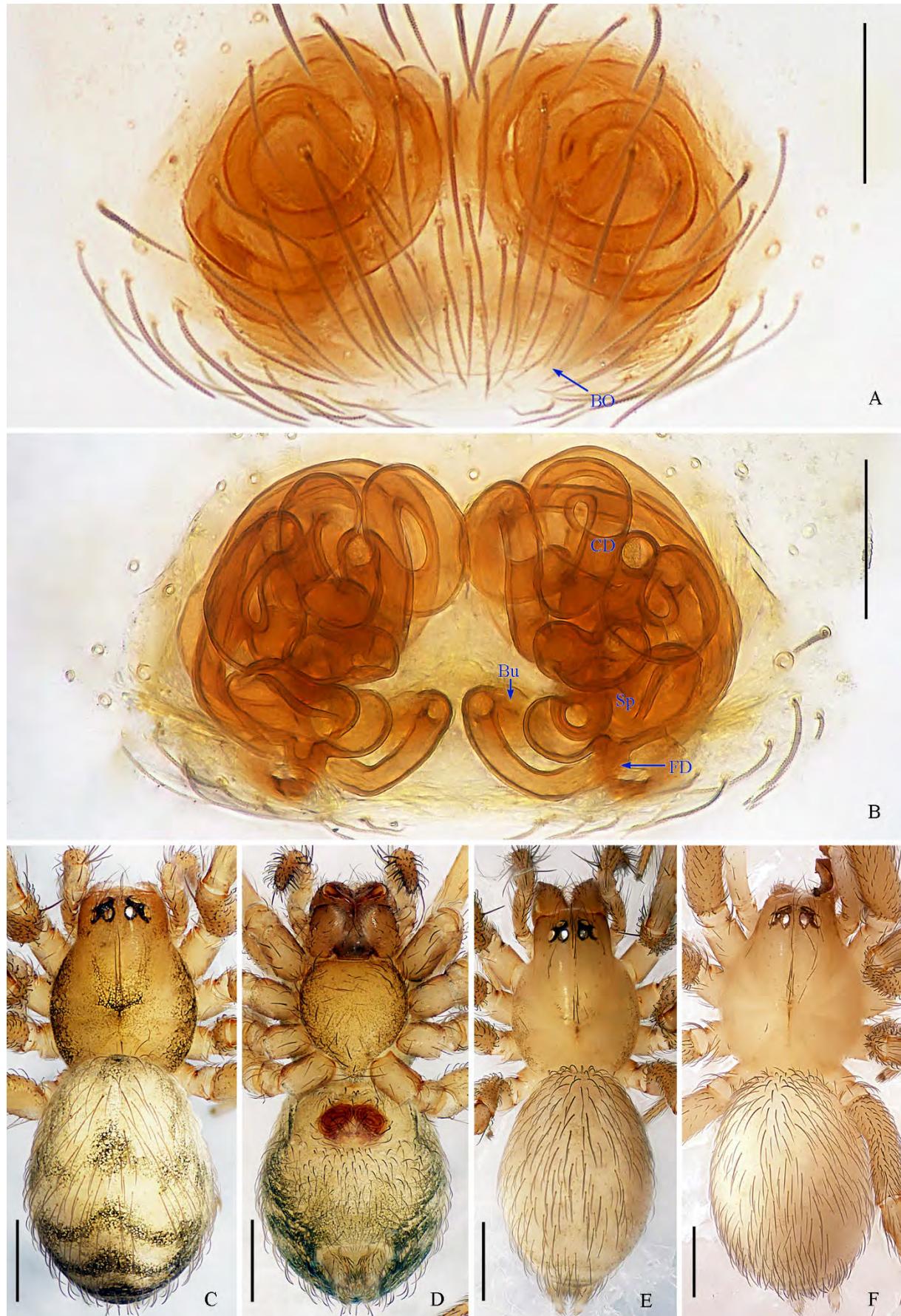


Figure 25. *Brommella josephkohi* Li, sp. nov. A–E. Paratype, females. F. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C, E. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–F=0.5 mm.

projection. Helical, slender copulatory ducts distinct from ventral view. Bursa slightly enlarged, not fused. Copulatory ducts extremely long, exceedingly convoluted. Spermathecae small, horizontally swollen, often partially crushed. Fertilization duct medially attached at base of spermathecae.

Variation. Total body length: males 2.80–3.00 ( $n=3$ ), females 2.30–3.18 ( $n=2$ ).

Distribution. Known only from the type locality (Fig. 97).

***Brommella linyuchengi* Li, sp. nov. (Figs 26–30, 97)**

Type material. Holotype. Male, China, Guangxi, Nanning City, Wuming County, Chengdong Town, Xiahuang Village, Taiji Cave,  $23^{\circ}11.050'N$ ,  $108^{\circ}19.818'E$ , elev. 111 m, 20 October 2010, X. Wang & L. Lin leg., deposited in IZCAS. Paratypes. 10 males, 7 females, same data as holotype, deposited in IZCAS.



Figure 26. *Brommella linyuchengi* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

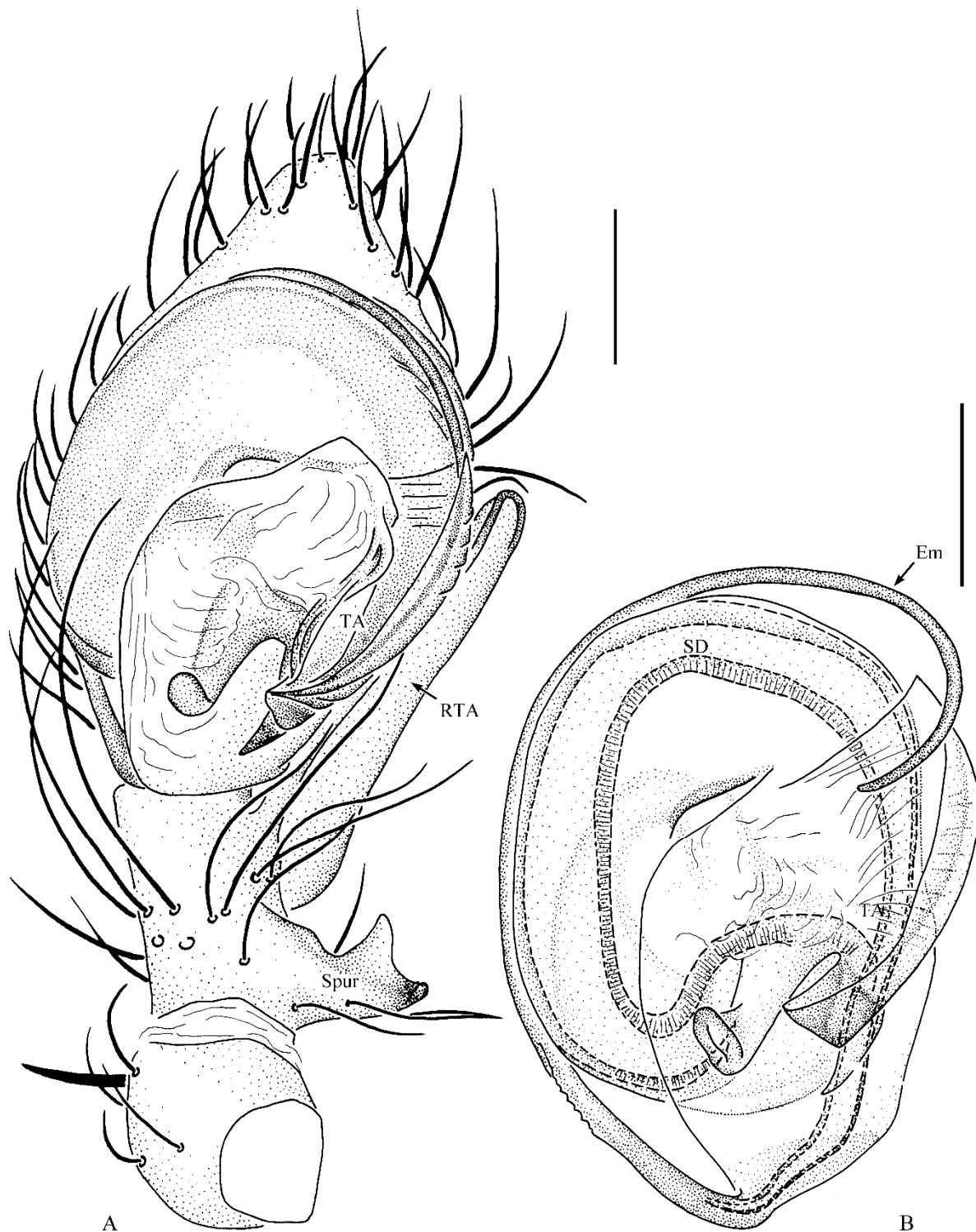


Figure 27. *Brommella linyuchengi* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

**Etymology.** The specific name is a patronym in honor of Prof. Yucheng Li from Sichuan University in Chengdu; noun in apposition. Prof. Lin is a leading taxonomist in Mysmenidae.

**Diagnosis.** The new species is similar to *B. punctosparsa* (Song, Zhu & Chen, 1999: 363, figs 213K–N), but can be distinguished by the widely separated copulatory openings (close in *B. punctosparsa*), the bent median apophysis (obtuse triangle-shaped in *B. punctosparsa*), and the dorsal lobe of epigynum acuminate and straight (hooked in *B. punctosparsa*).

**Description.** Male (holotype). Total body length 2.25 (Fig. 30E). Prosoma length 1.00, width 1.03. Dorsal shield of

prosoma yellow-brown. Cephalic region width 0.45, relatively flat, covered with several setae. Fovea reduced. Cervical groove indistinct. Six eyes, AME absent, all eyes white, encircled with black. Eye sizes and interdistances: ALE 0.08, PLE 0.09, PME 0.05; ALE-PLE 0.01, PLE-PME 0.02, PME-PME 0.06, ALE-ALE 0.05. Eye region length 0.14, width 0.27. Clypeus height 0.10. Chelicerae length 0.43, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 4 retromarginal teeth. Chelicerae yellow-brown. Labium and gnathocoxae yellow-brown, sternum yellow. Labium length 0.13, width 0.20. Gnathocoxae length 0.30, width 0.13. Sternum length 0.63, width 0.55. Legs yellow. Leg formula I-IV-II-III. Leg measurements: I 4.16 (1.20, 0.38, 1.10, 0.90, 0.58); II 3.50 (1.00, 0.35, 0.85, 0.80, 0.50); III 2.96 (0.85, 0.33, 0.65, 0.70, 0.43); IV 3.90 (1.15, 0.30, 1.00, 0.95, 0.50). Ratio Cl/Met IV = 0.34, with 5 setae. Opisthosoma length 1.25, width 0.85, pale yellow, without distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 26–27, 29). Cymbium 0.38 long. Embolus long, filiform, originating at approximately 7-o'clock position. TA prolaterally short and simple, with a tiny, sharply pointed apophysis. Prolateral part of TA with an upward bending apophysis. RTA large, simple, pointed distally, with a single fold. Base of tibia with a big bifurcated spur.

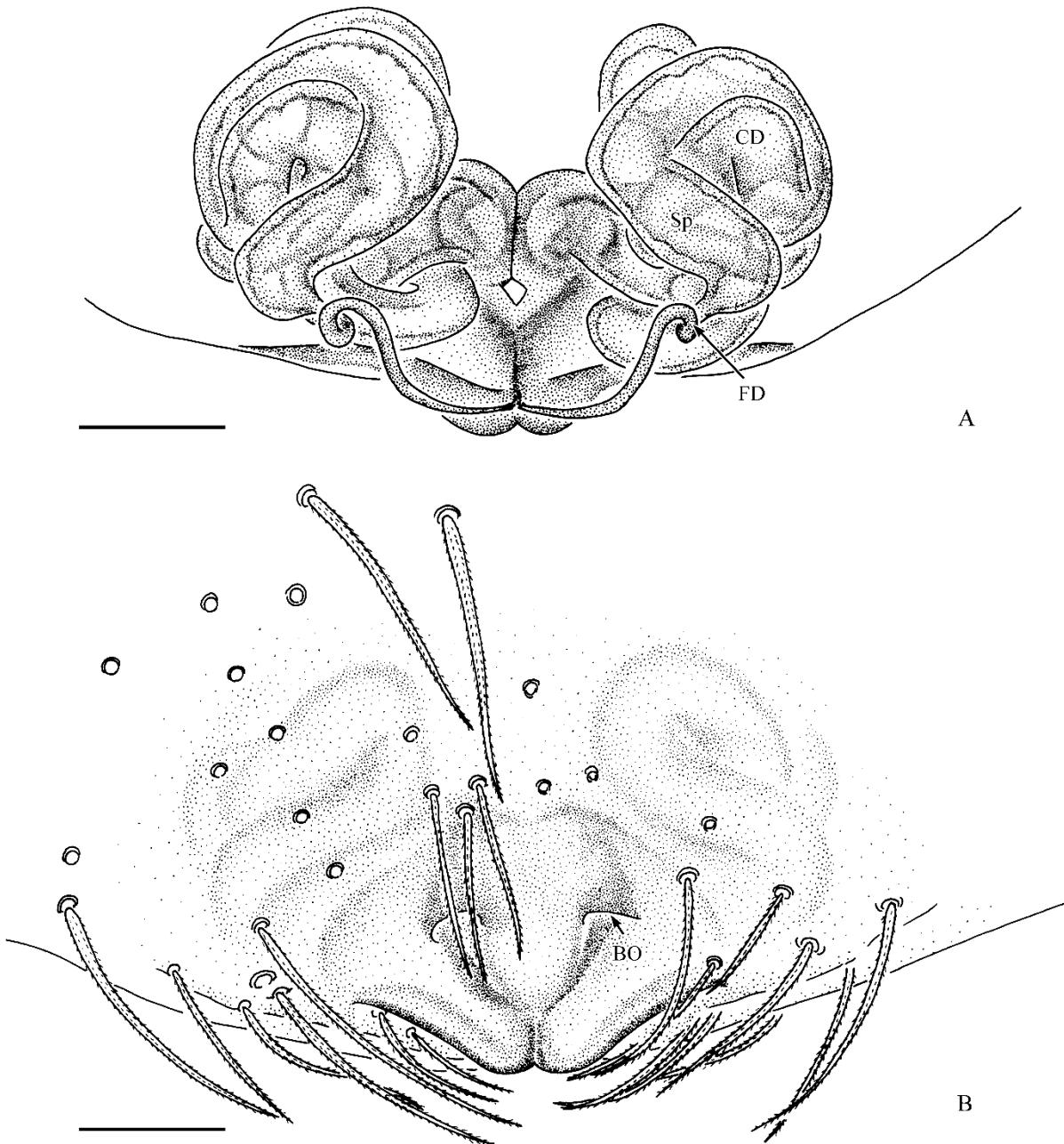


Figure 28. *Brommella linyuchengi* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

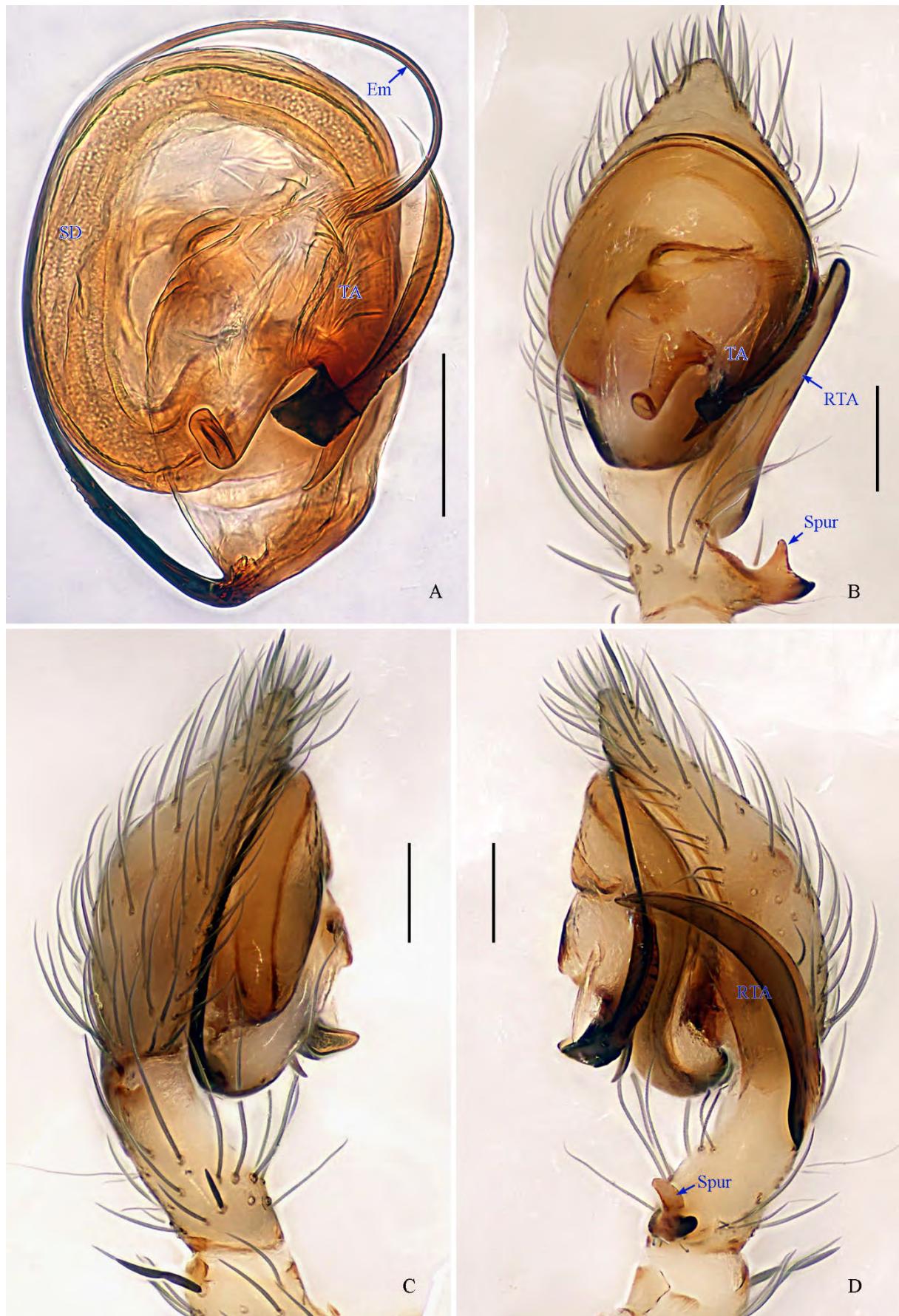


Figure 29. *Brommella linyuchengi* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

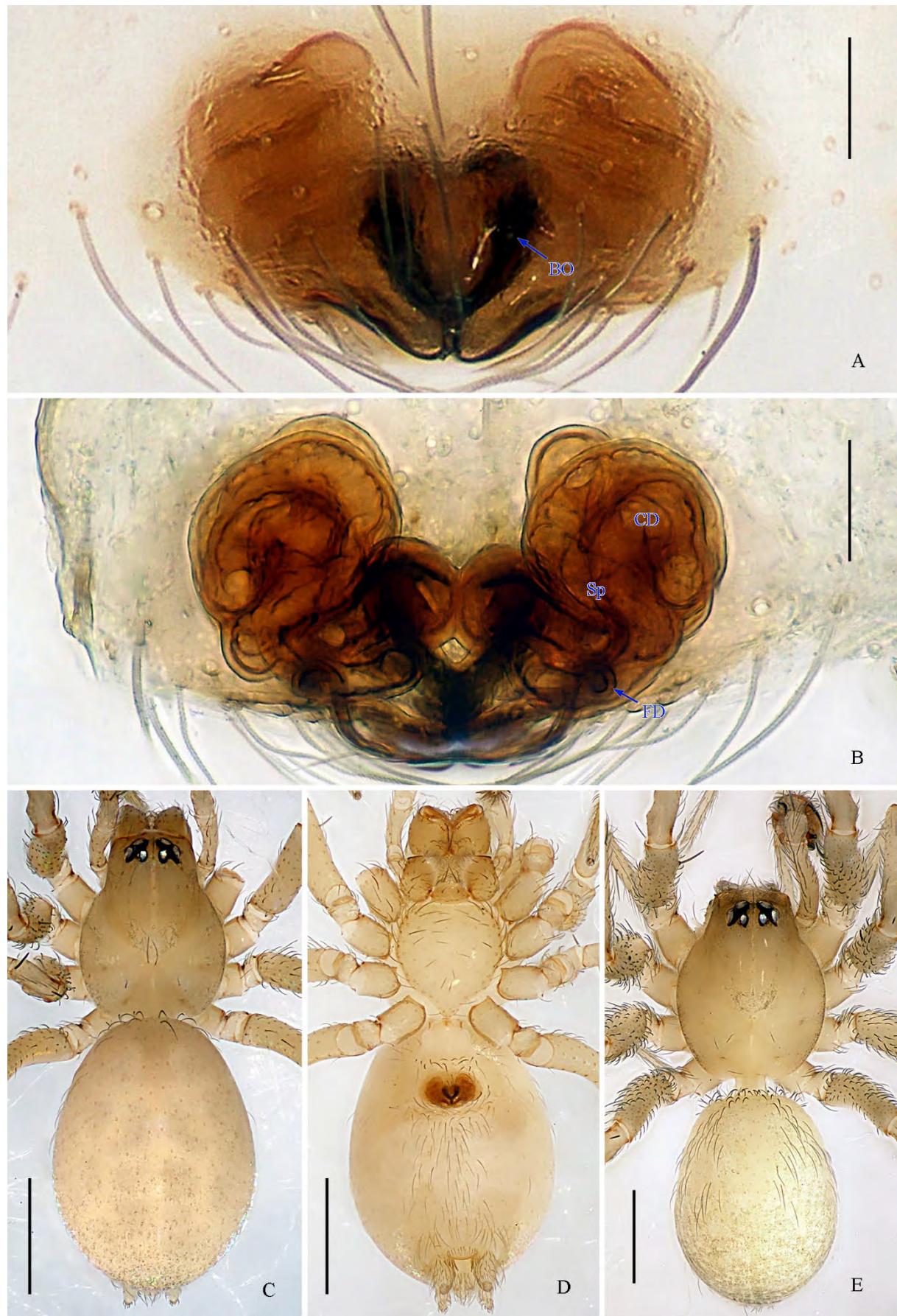


Figure 30. *Brommella linyuchengi* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–E=0.5 mm.

Female (one of the paratypes). Total body length 2.00 (Figs 30C–D). Prosoma length 0.82, width 0.63. Cephalic region width 0.45. Eye sizes and interdistances: ALE 0.06, PLE 0.07, PME 0.04; ALE-PLE 0.01, PLE-PME 0.03, PME-PME 0.05, ALE-ALE 0.05. Eye region length 0.14, width 0.25. Clypeus height 0.09. Chelicerae length 0.39, width 0.18. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Labium length 0.13, width 0.20. Gnathocoxae length 0.33, width 0.18. Sternum length 0.63, width 0.55. Leg formula I-IV-II-III. Leg measurements: I 2.72 (0.83, 0.28, 0.68, 0.55, 0.38); II 2.30 (0.70, 0.25, 0.50, 0.50, 0.35); III 2.09 (0.63, 0.25, 0.45, 0.45, 0.31); IV 2.69 (0.80, 0.28, 0.63, 0.63, 0.35). Ratio CI/Met IV=0.27, with 5 setae. Opisthosoma length 1.20, width 0.88.

Epigynum (Figs 28, 30A–B). Width 0.22. BO strongly sclerotized, widely separated. Bursae reduced. Copulatory ducts twisted tightly. Spermathecae parts not enlarged, “S”-shaped.

Variation. Total body length: males 1.80–2.30 ( $n=11$ ), females 1.70–2.50 ( $n=7$ ).

Distribution. Known only from the type locality (Fig. 97).

*Brommella renguodongi* Li, sp. nov. (Figs 31–35, 97)

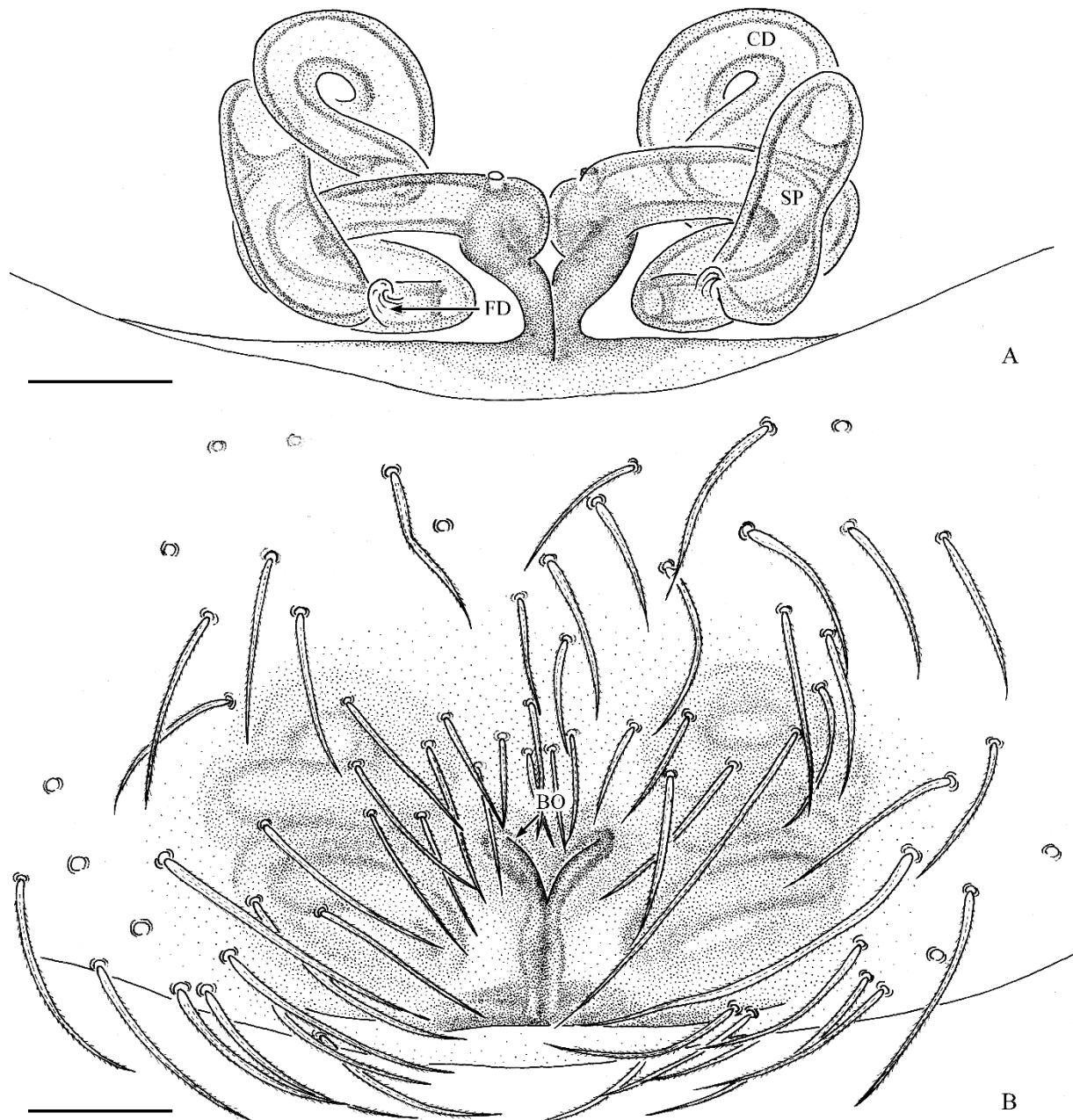


Figure 31. *Brommella renguodongi* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.



Figure 32. *Brommella renguodongi* Li, sp. nov., paratype, male. A. Right pedipalpus, prolateral view. B. Right pedipalpus, retrolateral view. Scale bar=0.1 mm.

Type material. Holotype. Female, China, Guangxi, Chongzuo City, Fusui County, Duxiufeng Hill, Shuilongyan Cave, 22°37.388'N, 107°54.047'E, elev. 86 m, 11 July 2011, X. Wang leg., deposited in IZCAS. Paratypes. 1 male, 17 females, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is a patronym in honor of Prof. Guodong Ren from Hebei University in Baoding; noun in apposition. A leading taxonomist in Tenebrionidae beetles, Prof. Ren has helped us in field work.

**Diagnosis.** Females may be distinguished from other Asian *Brommella* species, except *B. tongyanfengi* Li, sp. nov. (Figs 45–49), by the copulatory ducts with more rounded coils in ventral view (twisted not irregular in *B. tongyanfengi* Li, sp. nov.). Spermathecae slightly swollen, straight (swollen as tadpole shape in *B. tongyanfengi* Li, sp. nov.).

**Description.** Female (holotype). Total length 2.10 (Figs 35C–D). Prosoma length 1.00, width 0.71. Dorsal shield of prosoma yellow, with relatively flat cephalic area. Fovea reduced. Cervical groove indistinct. Six eyes, AME absent, all eyes white, encircled with black. Eye size and interdistances: ALE 0.06, PLE 0.08, PME 0.05; ALE-PLE 0.00, PLE-PME 0.02, PME-PME 0.07, ALE-ALE 0.10. Eye region length 0.28, width 0.13. Clypeus height 0.08. Chelicerae yellow-brown,

chelicerae length 0.40, width 0.20, with distinct lateral condyles and 3 promarginal and 5 retromarginal teeth. Labium and gnathocoxae yellow-brown, sternum yellow. Labium length 0.11, width 0.19. Gnathocoxae length 0.30, width 0.14. Sternum length 0.60, width 0.53. Legs yellow. Leg formula I-IV-II-III. Leg measurements: I 3.71 (1.08, 0.38, 0.95, 0.80, 0.50); II 3.09 (0.90, 0.33, 0.73, 0.68, 0.45); III 2.73 (0.81, 0.31, 0.60, 0.58, 0.43); IV 3.56 (1.05, 0.31, 0.81, 0.89, 0.50). Ratio Cl/Met IV = 0.25, with 9 setae. Opisthosoma 1.08 long, 0.84 wide. Opisthosoma oval, pale, without distinct pattern. Cribellum narrow, undivided.

Epigynum (Figs 31, 35A–B). Width 0.23. Bursae reduced. Copulatory ducts slender, twisted tightly (Figs 31A, 35B). Spermathecae slightly swollen, straight.

Male (paratype). Damaged.

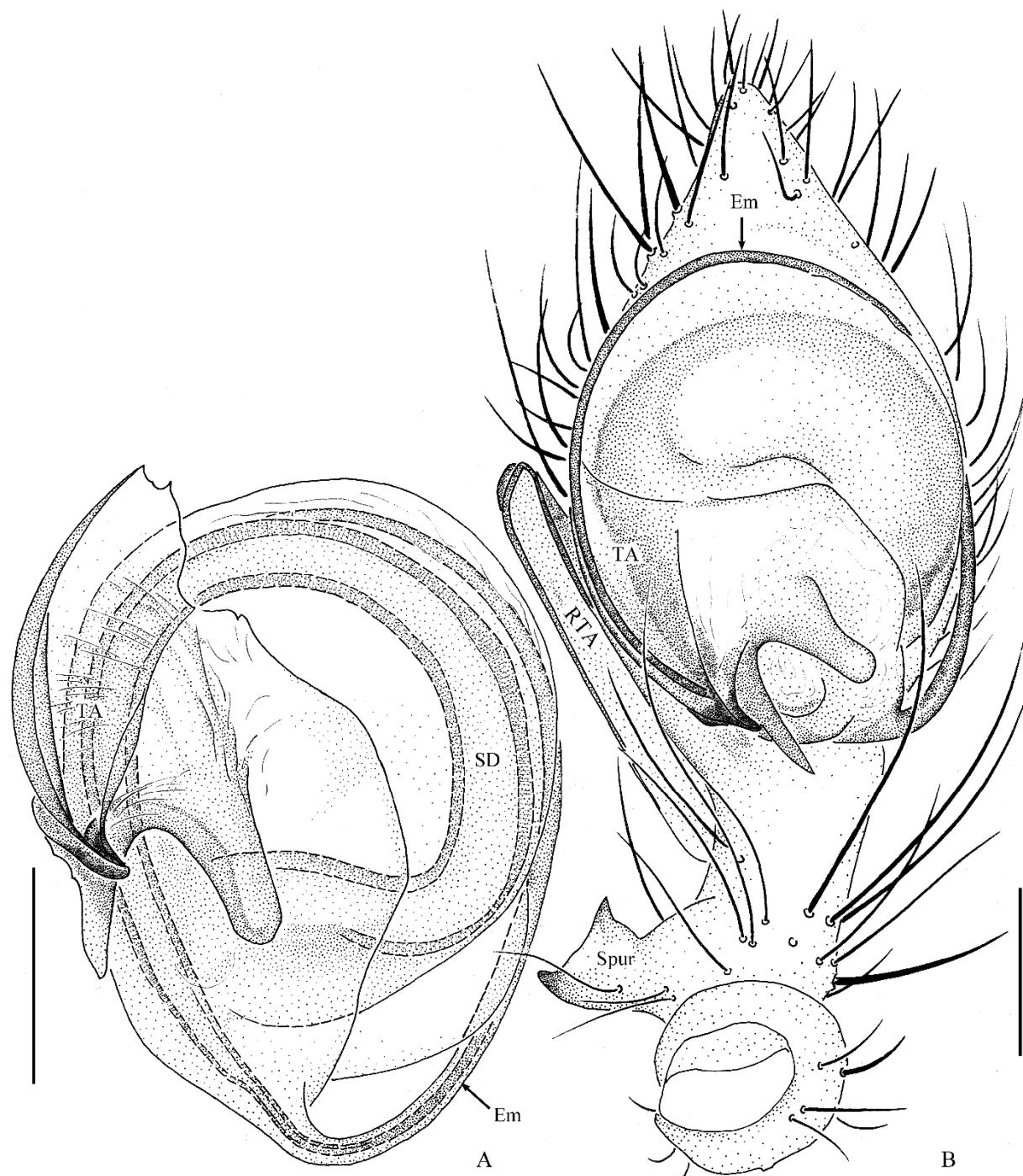


Figure 33. *Brommella renguodongi* Li, sp. nov., paratype, male. A. Right pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

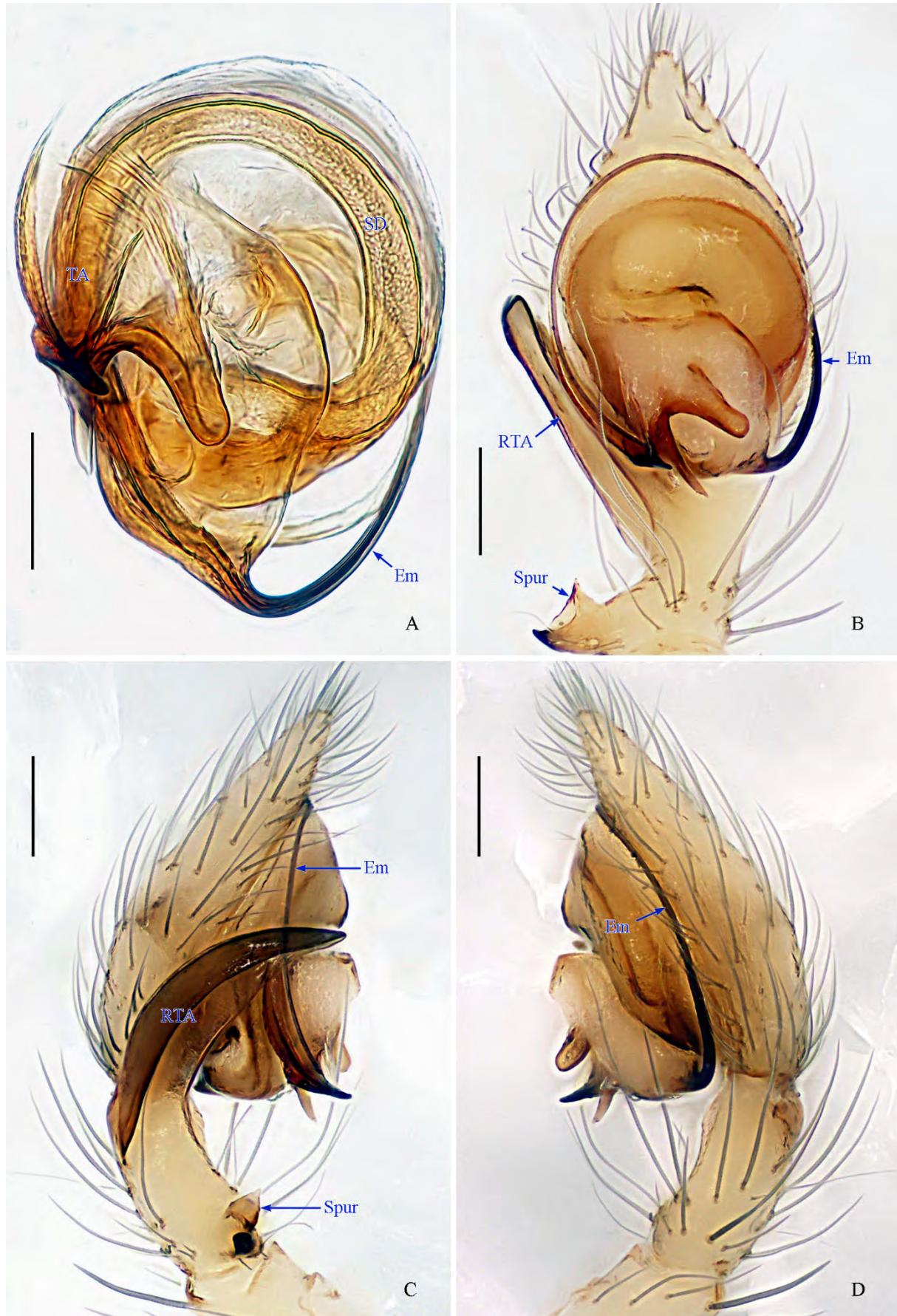


Figure 34. *Brommella renguodongi* Li, sp. nov., paratype, male. A. Palp bulb, ventral view. B. Right pedipalpus, ventral view. C. Right pedipalpus, prolateral view. D. Right pedipalpus, retrolateral view. Scale bars = 0.1 mm.



Figure 35. *Brommella renguodongi* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–D=0.5 mm.

Pedipalpus (Figs 32–34). Cymbium 0.38 long. Embolus long, filiform, originating at approximately 7-o'clock position. TA prolaterally short and simple. RTA large, simple, with a single fold. Base of tibia with a big bifurcated spur.

Variation. Total length: females 1.95–2.55 ( $n=18$ ).

Distribution. Known only from the type locality (Fig. 97).

***Brommella resima* Li, sp. nov.** (Figs 36–37, 97)

Type material. Holotype. Female, China, Guizhou, Tongren City, Yinjiang County, Eling Town, Yandi Village, Makou Cave, 27°59.629'N, 108°27.202'E, elev. 600m, 4 May 2010, Y. Lin & Q. Zhao leg., deposited in IZCAS.

Etymology. The specific name is derived from the Latin word “*resimus*”, meaning “with upturned nose”, and refers to the shape of sclerotized lateral lobe edges and BO of epigynum; adjective.

Diagnosis. Females of this new species appear almost identical to *B. punctosparsa* (Song, Zhu & Chen, 1999: 363, figs 213K–N), but can be distinguished by the detailed structure of epigynum.

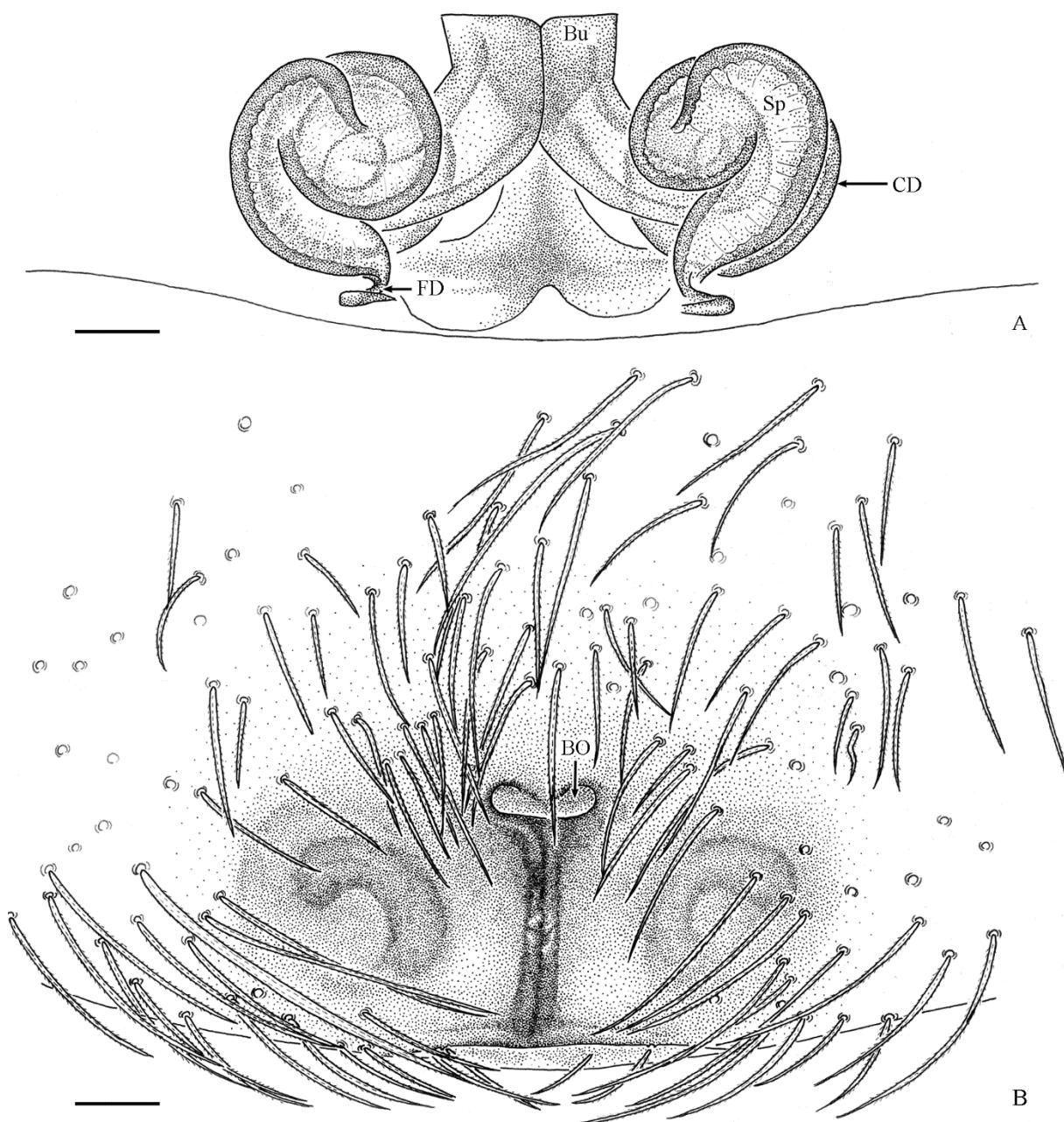


Figure 36. *Brommella resima* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

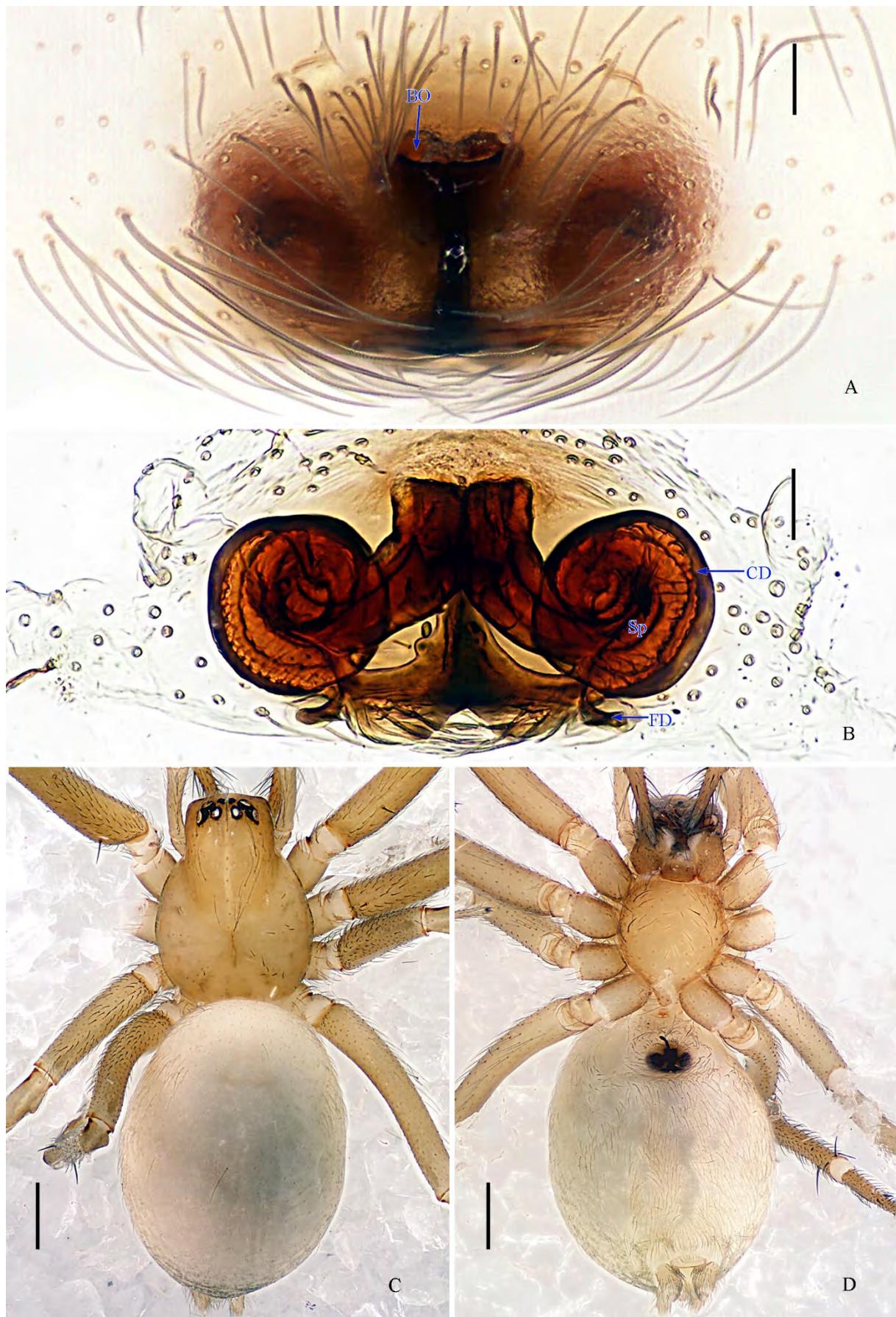


Figure 37. *Brommella resima* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–D=0.5 mm.

Description. Female (holotype). Total length 3.80 (Figs 37C–D). Prosoma length 1.75, width 1.20. Cephalic region width 0.70. Cephalic part flat, covered with several setae. Thoracic part brown, fovea reduced, prosoma margin indistinct. Eight eyes, AME black, others white, all eyes encircled with black. Eye diameters: AME 0.04, ALE 0.10, PLE 0.10, PME 0.08. Eye interdistances: ALE-PLE 0.03, AME-ALE 0.04, AME-AME 0.05, PLE-PME 0.07, PME-PME 0.10. Eye region length 0.21, width 0.74. Clypeus height 0.13. Chelicerae length 0.65, width 0.33. Chelicerae brown, with distinct lateral condyles, 3 (1 large, 2 small) promarginal and 5 retromarginal teeth. Labium and gnathocoxae brown, sternum light brown. Labium length 0.19, width 0.28. Gnathocoxae length 0.50, width 0.25. Sternum length 0.90, width 0.85. Legs light brown. Leg formula I-IV-II-III. Leg measurements: I 7.70 (2.25, 0.70, 2.10, 1.70, 0.95); II 6.30 (1.90, 0.60, 1.60, 1.40, 0.80); III 5.60 (1.70, 0.50, 1.20, 1.40, 0.80); IV 7.20 (2.05, 0.60, 1.75, 1.80, 1.00). Ratio Cl/Met IV=0.42, with 16 setae. Opisthosoma length 1.60, width 2.23. Opisthosoma yellow, without distinct pattern. Cribellum narrow, undivided.

Epigynum (Figs 36, 37A–B). Width 0.31. Copulatory ducts coiled as circle in ventral view. Bursae reduced. Copulatory ducts slender, twisted tightly (Figs 36A, 37B). Spermathecae swollen, coiled along epigynal duct ball.

Male. Unknown.

Distribution. Known only from the type locality (Fig. 97).

***Brommella sejuncta* Li, sp. nov. (Figs 38–39, 97)**

Type material. Holotype. Female, China, Guangxi, Hechi City, Fengshan County, Fengcheng Town, Songren Village, Xi'an Cave, 24°33.941'N, 107°02.465'E, elev. 574 m, 12 March 2007, Y. Lin & J. Liu leg., deposited in IZCAS.

Etymology. The specific name is derived from the Latin word “sejunctus”, meaning “separated”, and refers to the

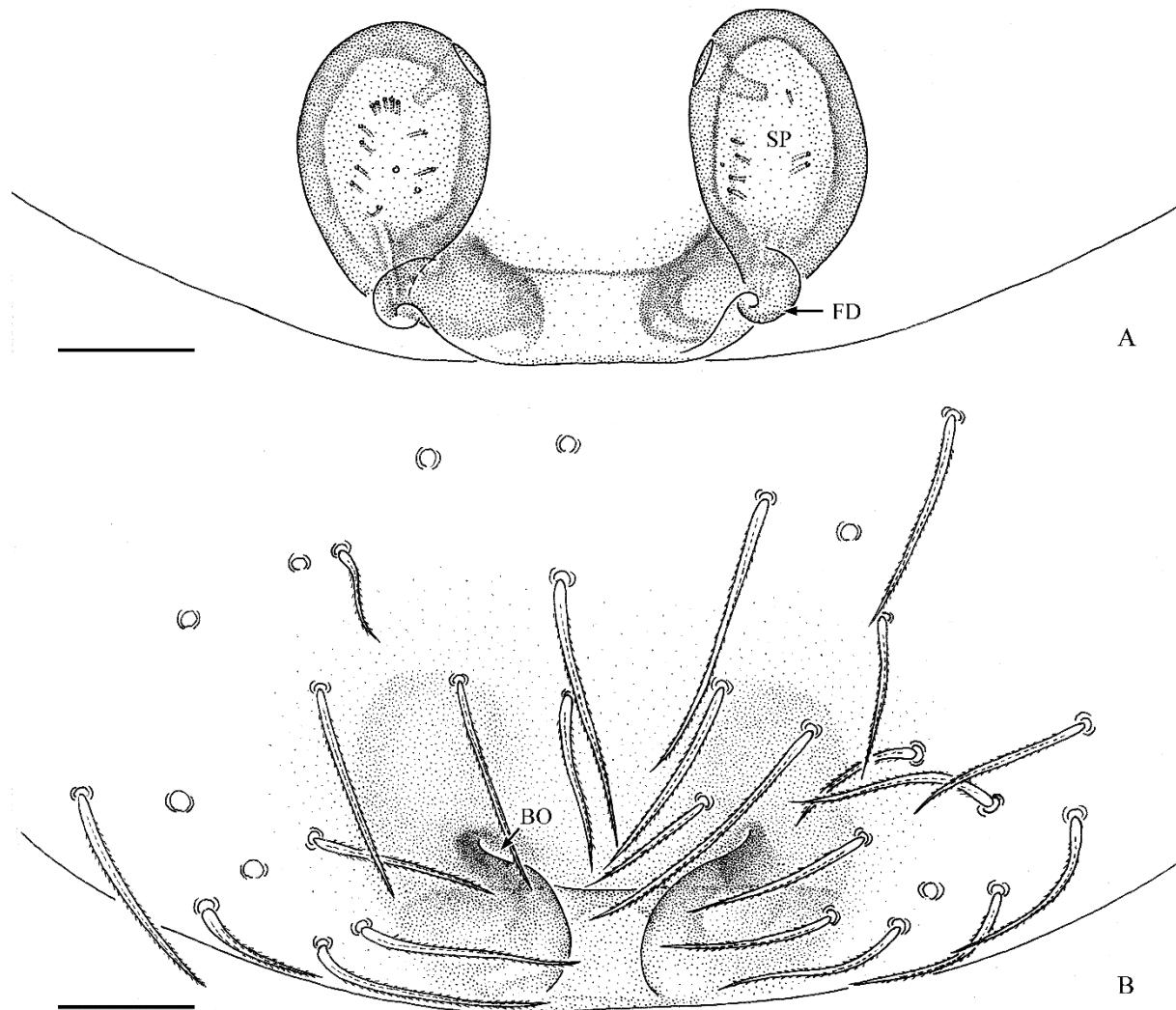


Figure 38. *Brommella sejuncta* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.05 mm.

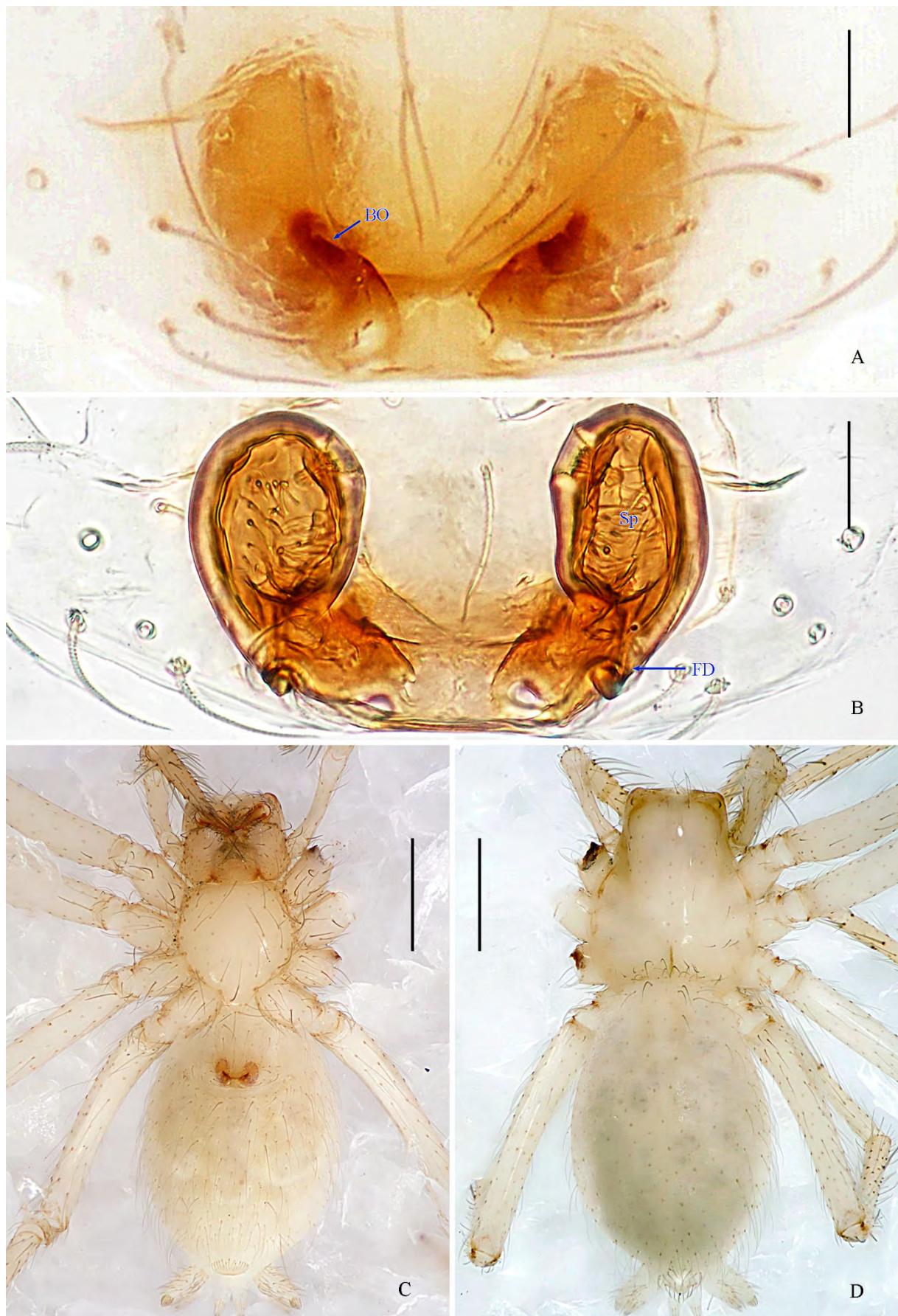


Figure 39. *Brommella sejuncta* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–D=0.5 mm.

separated sclerotized lateral lob rims of the female epigynum; adjective.

Diagnosis. Females of this new species are most similar to *Brommella yizhouensis* Li, sp. nov. (Figs 57–61), but can be distinguished by the separated lateral lob rims (fused in *B. yizhouensis* Li, sp. nov.), the extremely short copulatory ducts (slender and twisted tightly in *B. yizhouensis* Li, sp. nov.), the large and pear-shaped spermathecae.

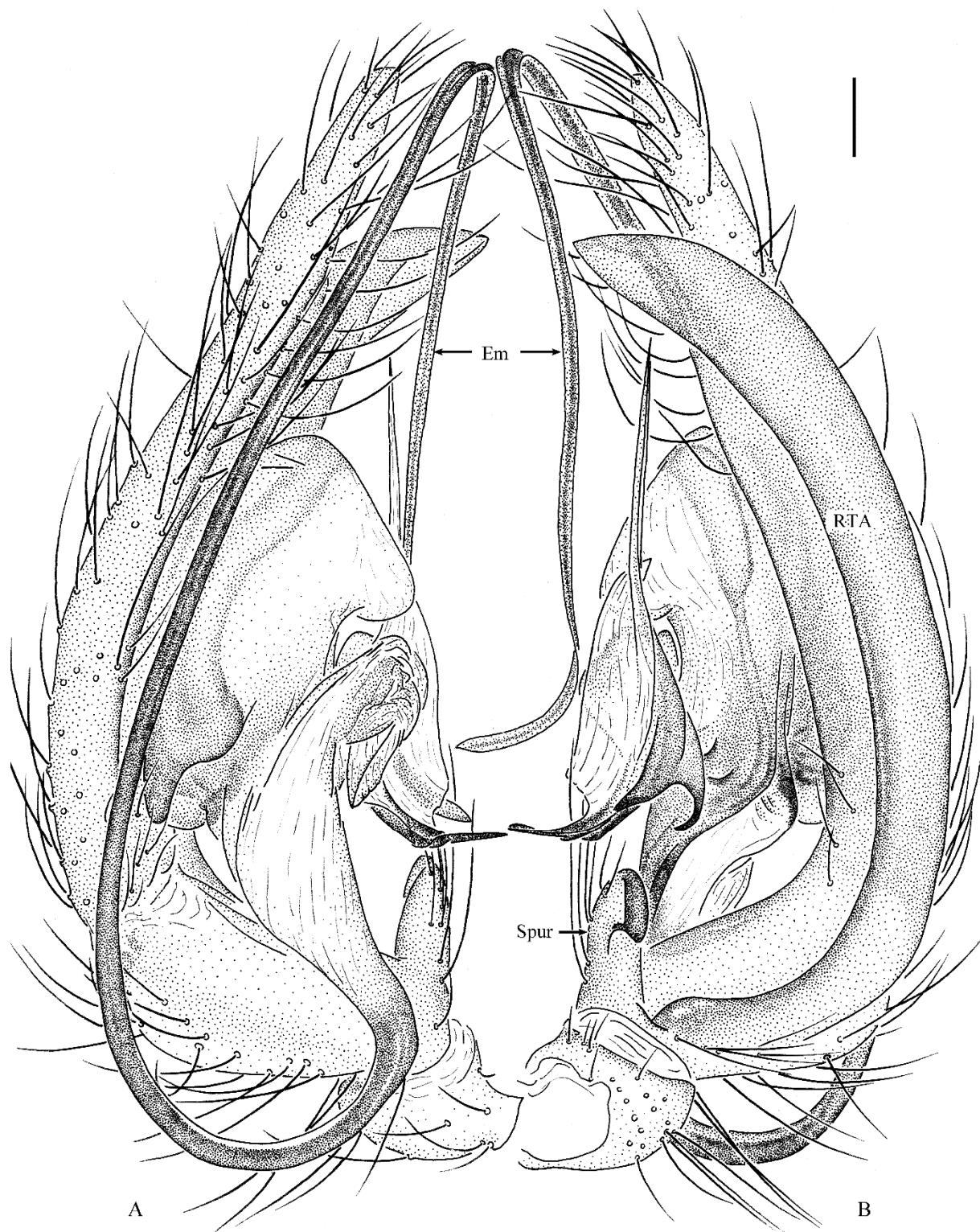


Figure 40. *Brommella spirula* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

Description. Female (holotype). Total length 2.20 (Figs 39C–D). Prosoma length 0.93, width 0.75. Cephalic area width 0.45. Carapace pyriform, cephalic part relatively flat, covered with several setae. Thoracic part yellow, fovea reduced,

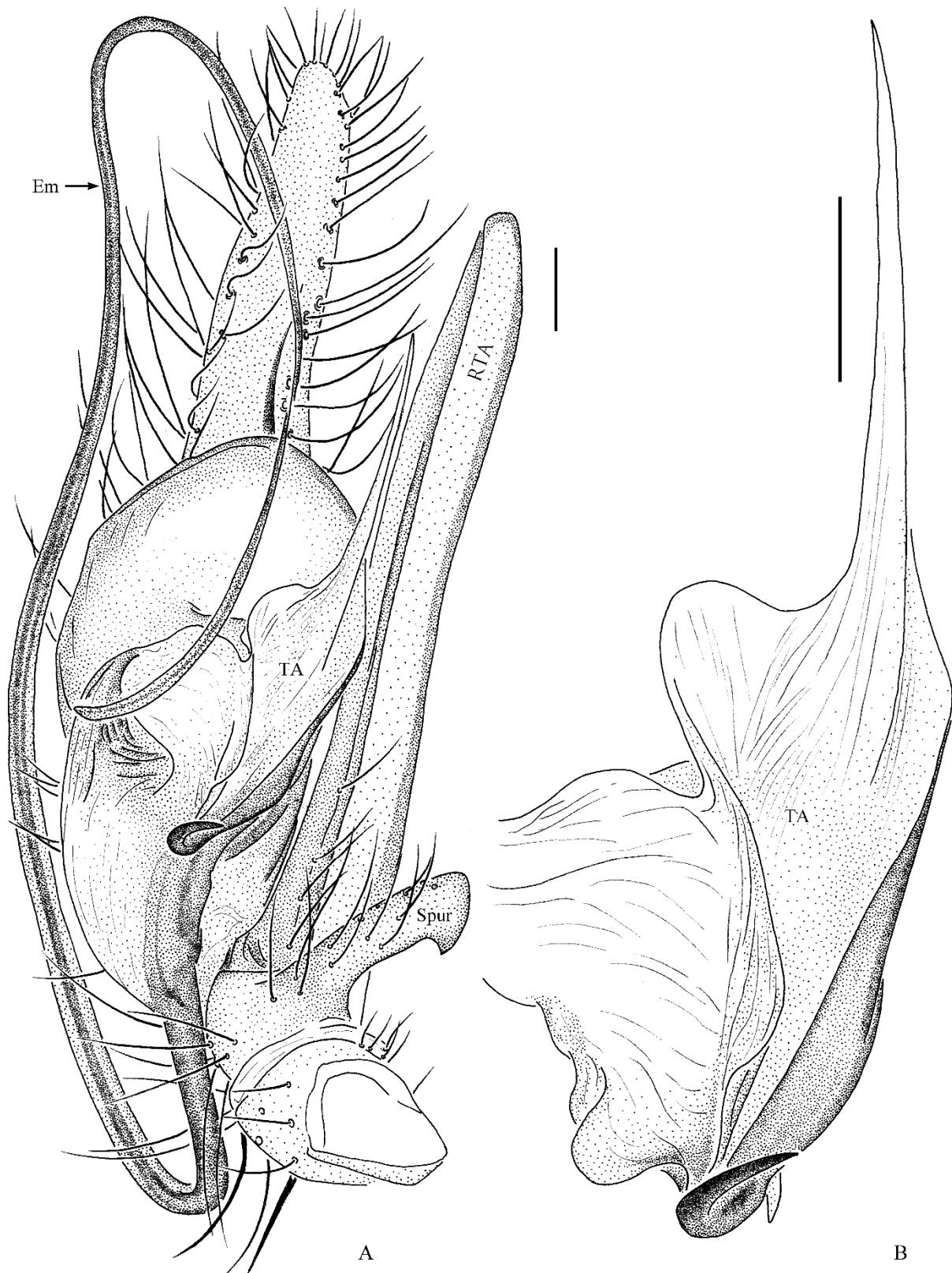


Figure 41. *Brommella spirula* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

carapace margin distinct. No eyes. Chelicerae length 0.43, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Chelicerae, labium and gnathocoxae yellow-brown; sternum yellow. Labium length 0.11, width 0.20. Gnathocoxae length 0.30, width 0.16. Sternum length 0.55, width 0.50. Legs yellow. Leg formula IV-I-II-III. Leg measurements: I 3.95 (1.10, 0.40, 1.00, 0.85, 0.60); II 3.69 (1.03, 0.33, 0.88, 0.85, 0.60); III 3.39 (1.00, 0.30, 0.75, 0.80, 0.54); IV 4.15 (1.14, 0.33, 1.00, 1.05, 0.63). Ratio CI/Met IV=0.25, with 7 curved setae. Opisthosoma length 1.25, width 0.85. Opisthosoma pale, without distinct pattern. Cribellum narrow, undivided.

Epigynum (Figs 38, 39A–B). Width 0.24. Spermathecae pear-shaped, can be easily seen in ventral view. Copulatory ducts very short, not observable in dorsal view. Fertilization duct long, medially attached at base of spermathecae.

Male. Unknown.

Distribution. Known only from the type locality (Fig. 97).

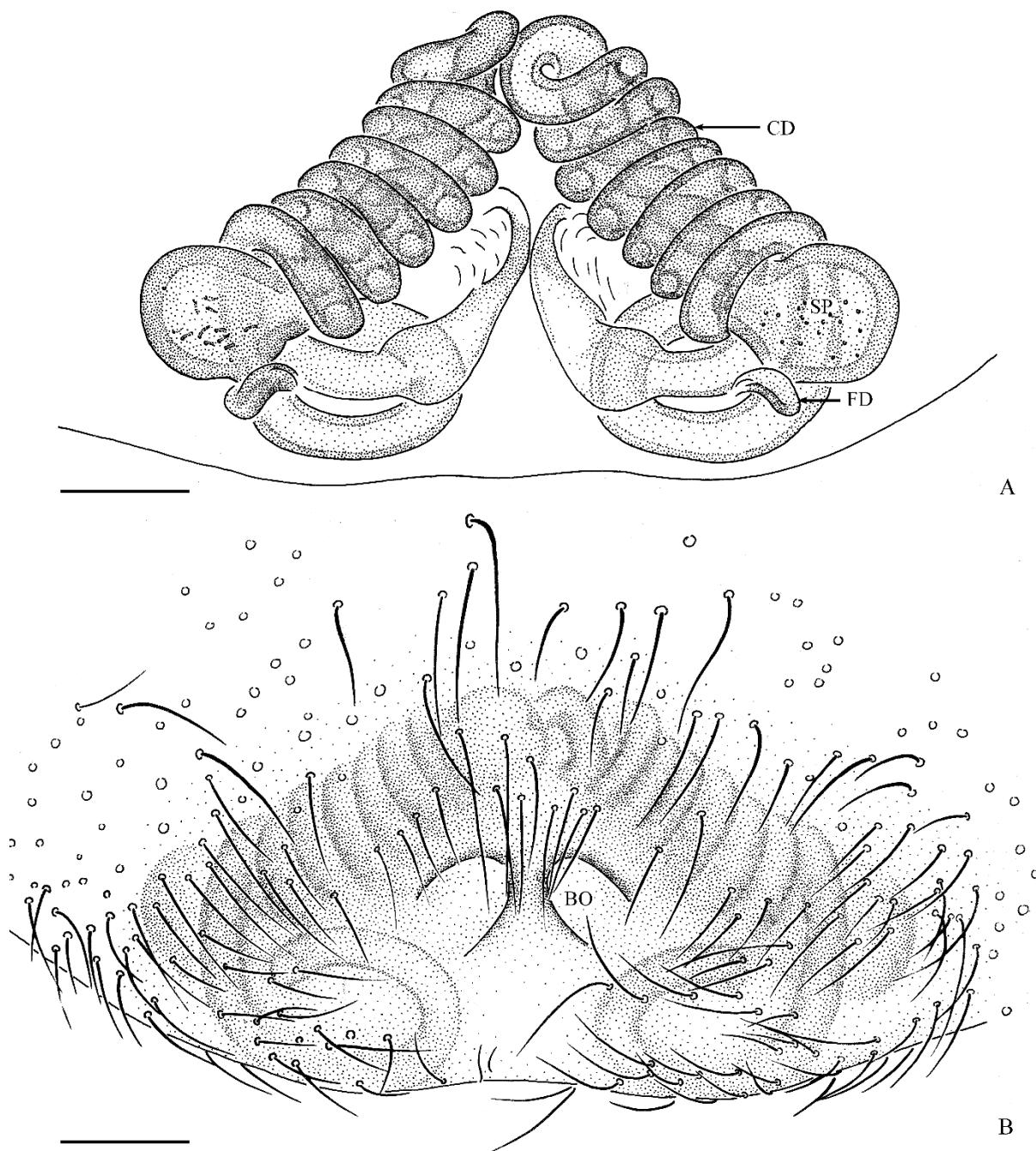


Figure 42. *Brommella spirula* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.1 mm.

***Brommella spirula* Li, sp. nov.** (Figs 40–44, 97)

Type material. Holotype. Male, China, Guangxi, Baise City, Tiandong County, Silin Town, Guangyang Village, Guangyang Cave,  $23^{\circ}31.106'N$ ,  $107^{\circ}23.623'E$ , elev. 374 m, 02 August 2011, X. Wang leg., deposited in IZCAS. Paratypes. 1 male, 37 females, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is derived from the Latin word “*spirula*”, meaning “spiral”, and refers to the shape of female copulatory ducts; noun in apposition.

**Diagnosis.** Female of this new species is similar to *B. chongzuoensis* Li, sp. nov. (Figs 9–10), but can be distinguished by the small brusal openings (BO very large in *B. chongzuoensis* Li, sp. nov.), the copulatory ducts coiled tightly as spring (more loose coiled in *B. chongzuoensis* Li, sp. nov.); males of this new species appear almost identifical with *B. dolabrata* Li, sp. nov. (Figs 11–15), but can be distinguished by the shape of apophysis (straight in *B. dolabrata* Li, sp. nov.), the tip of spur pointed and hooked (apex of spur broad in *B. dolabrata* Li, sp. nov.).

**Description.** Male (holotype). Total length 2.72 (Fig. 44E). Prosoma length 1.20, width 1.00. Cephalic region width 0.60. Dorsal shield of prosoma yellow, with relatively flat cephalic area. Fovea reduced, cervical groove indistinct. Six eyes, AME absent, all eyes white, encircled with black. Eye diameters: ALE 0.15, PLE 0.10, PME 0.08. Eye interdistances: ALE-PLE 0.02, PLE-PME 0.04, PME-PME 0.07, ALE-ALE 0.06. Clypeus height 0.14. Chelicerae length 0.48, width 0.23, with distinct lateral condyles, and 3 promarginal and 4 retromarginal teeth. Cheliceraes, labium and gnathocoxae yellow-brown, sternum yellow. Labium length 0.13, width 0.22; gnathocoxae length 0.35, width 0.22; sternum length 0.74, width 0.69. Legs yellow. Leg formula I-IV-II-III. Leg measurements: I 6.01 (1.65, 0.45, 1.63, 1.40, 0.88); II 4.78 (1.38, 0.40, 1.15, 1.10, 0.75); III 4.23 (1.20, 0.40, 0.93, 1.05, 0.65); IV 5.56 (1.55, 0.40, 1.35, 1.43, 0.83). Ratio Cl/Met IV = 0.38, with 6 setae. Opisthosoma length 1.50, width 1.13. Opisthosoma oval, dorsum white, with several dark-green spots, venter white. Cribellum narrow, undivided.

Pedipalpus (Figs 40–41, 43). Cymbium 1.11 long. Cymbium narrowed distally, ratio length/width = 2.43. Embolus slender, ribbon shaped, originating at approximately 6-o’clock position, TA prolaternally slim, strongly sclerotized, pointing to retrolateral. TA retrolateral large, with a single fold.

Female (one of the paratypes). Total length 3.35 (Figs 44C–D). Prosoma length 1.30; width 1.08. Cephalic region width 0.53. Eye diameters: ALE 0.12, PLE 0.11, PME 0.09. Eye interdistances: ALE-PLE 0.04, PLE-PME 0.05, PME-PME 0.08, ALE-ALE 0.08. Clypeus height 0.13. Chelicerae length 0.53, width 0.30, with distinct lateral condyles, 5 promarginal and 7 retromarginal teeth. Labium length 0.17, width 0.25. Gnathocoxae length 0.45, width 0.25. Sternum length 0.83, width 0.75. Leg formula I-IV-II-III. Leg measurements: I 6.08 (1.75, 0.50, 1.55, 1.40, 0.88); II 4.69 (1.35, 0.48, 1.13, 1.00, 0.73); III 4.19 (1.20, 0.43, 0.93, 0.98, 0.65); IV 5.41 (1.63, 0.45, 1.25, 1.30, 0.78). Opisthosoma length 2.20, width 1.55. Ratio Cl/Met IV = 0.4, with 10 setae.

Epigynum (Figs 42, 44A–B). Width 0.58. Small BO situated in the centre of epigynum, small, their sclerotized rims convex relative to centre of epigynum. Bursae developed. Copulatory ducts tightly coiled as doubled spring. Spermathecae small, ball shaped. Fertilization duct internally attached at base of spermathecae.

**Variation.** Total length: males 2.72–3.00 ( $n=2$ ), females 2.50–3.35 ( $n=37$ ).

**Distribution.** Known only from the type locality (Fig. 97).

***Brommella tongyanfengi* Li, sp. nov.** (Figs 45–49, 97)

Type material. Holotype. Male, China, Guangxi, Laibin City, Xiangzhou County, Xiangzhou Town, cave without name,  $23^{\circ}57.278'N$ ,  $109^{\circ}39.696'E$ , elev. 114 m, 10 October 2010, X. Wang & L. Lin leg., deposited in IZCAS. Paratypes. 24 females, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is a patronym in honor of Prof. Yanfeng Tong from Shenyang Normal University in Shenyang; noun in apposition. Prof. Tong is a leading taxonomist in Oonopidae in China.

**Diagnosis.** This new species is similar to *B. punctosparsa* (Song, Zhu & Chen, 1999: 363, figs 213K–N), but can be distinguished by the oar-shaped dictynid TA dorsal apophysis, ending with row of denticles (acuminate and hooked in *B. punctosparsa*), medial apophysis short finger-shaped (obtuse triangle-shaped in *B. punctosparsa*).

**Description.** Male (holotype). Total body length 2.25 (Fig. 49E). Prosoma length 1.00, width 0.75. Cephalic region width 0.45. Cephalic part relatively flat, off-white, covered with several setae, fovea reduced, Prosoma margin dark. Six eyes, AME absent, all eyes white, encircled with black. Eye diameters: ALE 0.08, PLE 0.09, PME 0.05. Eye interdistances: ALE-PLE 0.01, PLE-PME 0.03, PME-PME 0.08, ALE-ALE 0.08. Eye region length 0.17, width 0.30. Clypeus height 0.11. Chelicerae length 0.50, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth.

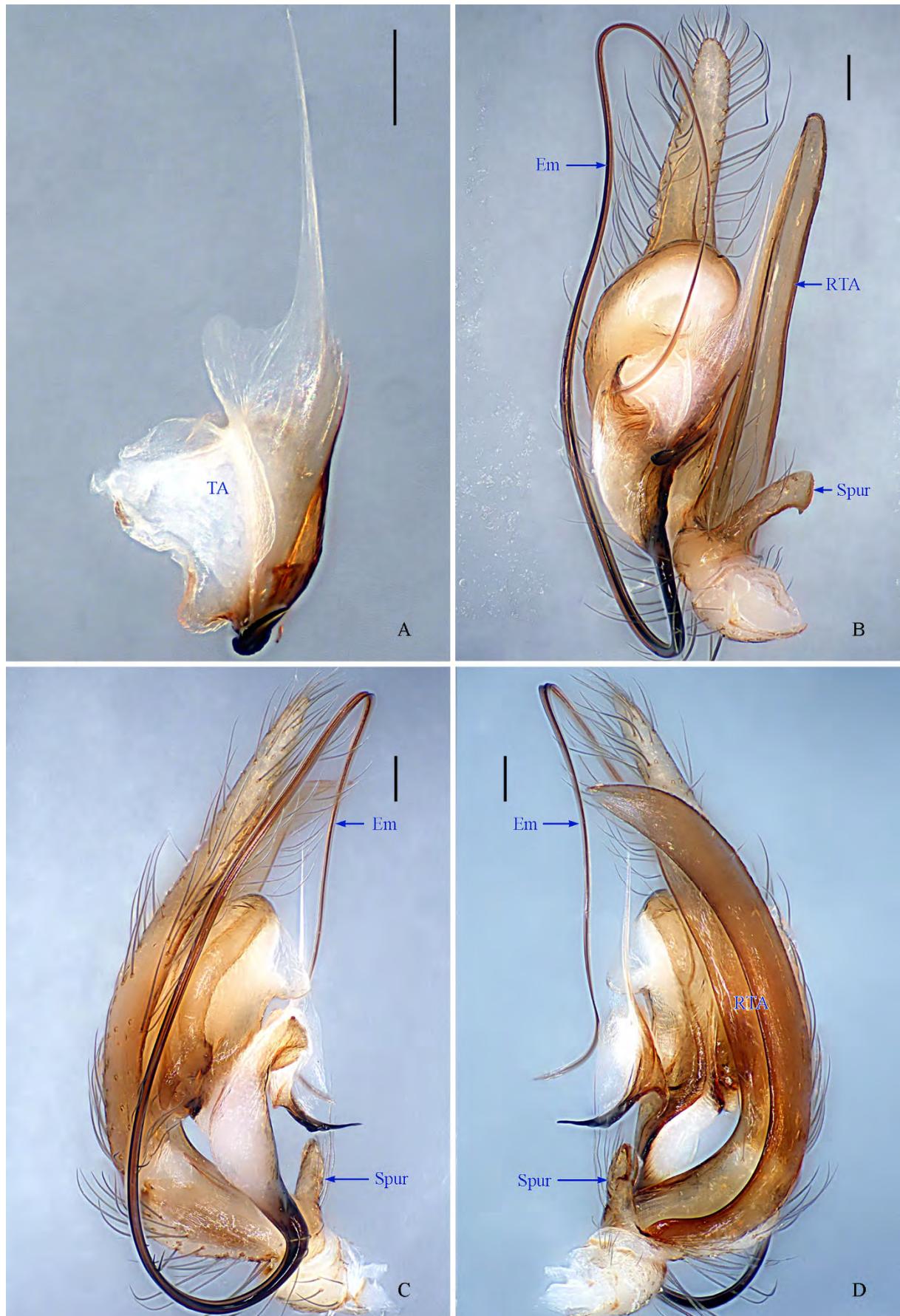


Figure 43. *Brommella spirula* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

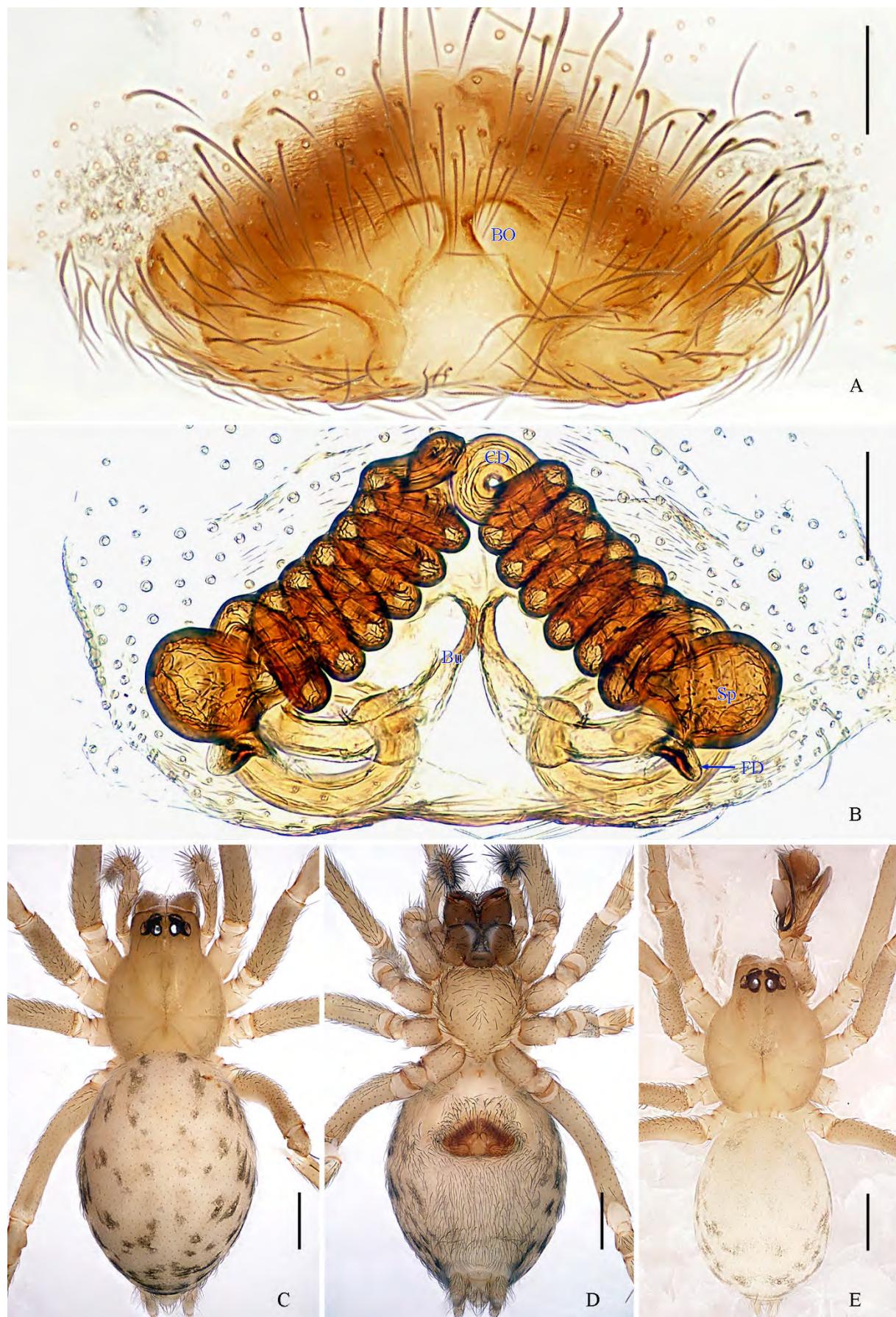


Figure 44. *Brommella spirula* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B = 0.1 mm; C–E = 0.5 mm.

Labium and gnathocoxae brown, sternum light brown. Labium length 0.08, width 0.18. Gnathocoxae length 0.28, width 0.20. Sternum length 0.60, width 0.58. Leg formula I-IV-II-III. Leg measurements: I 3.95 (1.10, 0.35, 1.05, 0.85, 0.60); II 3.35 (0.95, 0.35, 0.80, 0.75, 0.50); III 2.85 (0.85, 0.30, 0.60, 0.65, 0.45); IV 3.70 (1.05, 0.35, 0.90, 0.90, 0.50). Ratio Cl/Met IV = 0.43, with 7 setae. Opisthosoma length 1.25, width 1.10. Opisthosoma beige, without distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 45–46, 48). Cymbium 0.46 long. Embolus long, filiform, originating from approximately 6-o'clock position. TA prolatally short and simple. Prolateral part of TA with a short finger-shaped apophysis, constricted medially. RTA very large, curved, with a single fold. Base of tibia with a big bifurcated spur.



Figure 45. *Brommella tongyanfengi* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar = 0.1 mm.



Figure 46. *Brommella tongyanfengi* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars=0.1 mm.

Female (one of the paratypes). Total body length 2.50 (Figs 49C–D). Prosoma length 0.93, width 0.70. Cephalic region width 0.43. Eye diameters: ALE 0.07, PLE 0.08, PME 0.06. Eye interdistances: ALE-PLE 0.02, PLE-PME 0.04, PME-PME 0.05, ALE-ALE 0.06. Eye region length 0.15, width 0.30. Clypeus height 0.08. Chelicerae length 0.38, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 6 retromarginal teeth. Labium length 0.11, width 0.19. Gnathocoxae length 0.29, width 0.18. Sternum length 0.58, width 0.55. Leg formula IV-I-II-III. Leg measurements: I 3.18 (0.94, 0.31, 0.81, 0.69, 0.43); II 2.75 (0.83, 0.30, 0.64, 0.58, 0.40); III 2.42 (0.73, 0.25, 0.50, 0.56, 0.38); IV 3.23 (0.95, 0.40, 0.80, 0.75, 0.43). Ratio CI/Met IV=0.37, with 8 setae. Opisthosoma length 1.50, width 1.10.

Epigynum (Figs 47, 49A–B). Width 0.23. BO small and close. Bursae reduced. Copulatory ducts slender, twisted tightly (Figs 47A, 49B). Spermathecae part slightly swollen, tadpole shaped.

Variation. Total body length: females 1.8–2.5 ( $n=24$ ).

Distribution. Known only from the type locality (Fig. 97).

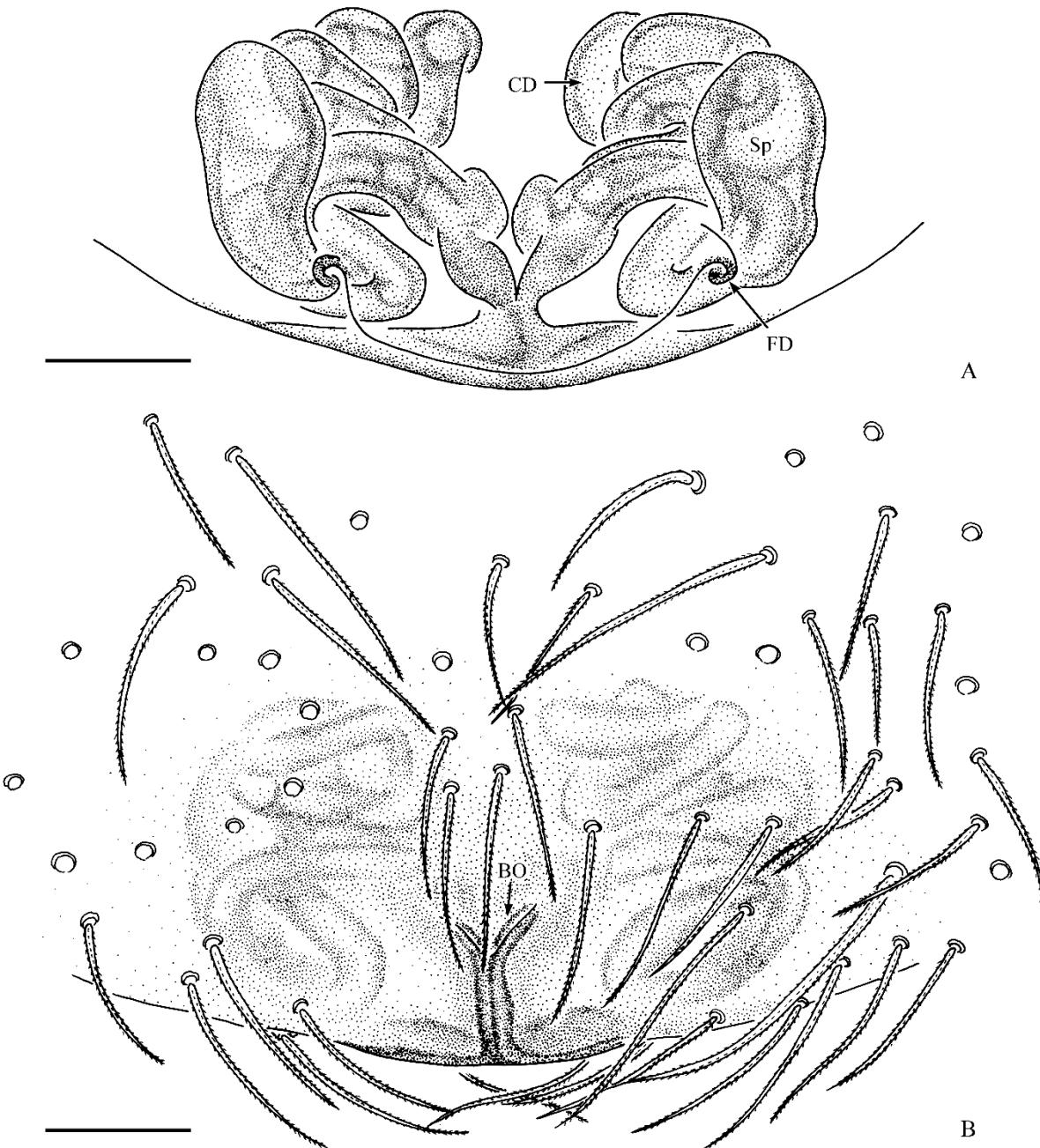


Figure 47. *Brommella tongyanfengi* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

#### *Brommella wangfengcheni* Li, sp. nov. (Figs 50–51, 97)

Type material. Holotype. Female, China, Guangxi, Chongzuo City, Tiandeng County, Dukang Town, Bakong Village, cave without name, 23°06.708'N, 107°04.558'E, elev. 480 m, 29 July 2011, X. Wang leg., deposited in IZCAS.

Etymology. The specific name is a patronym in honor of the late Prof. Fengchen Wang (1906–1978) from Norman Bethune University of Medical Sciences (now Jilin University); noun in apposition. Prof. Wang is the first Chinese zoologist to carry out a systematic national-scale survey of spiders and harvestmen.

Diagnosis. Females of this new species closely resemble those of *B. baiseensis* Li, sp. nov. (Figs 4, 6A–D), but can be distinguished by the twin-looped copulatory ducts (four loops can be seen in *B. baiseensis* Li, sp. nov.).

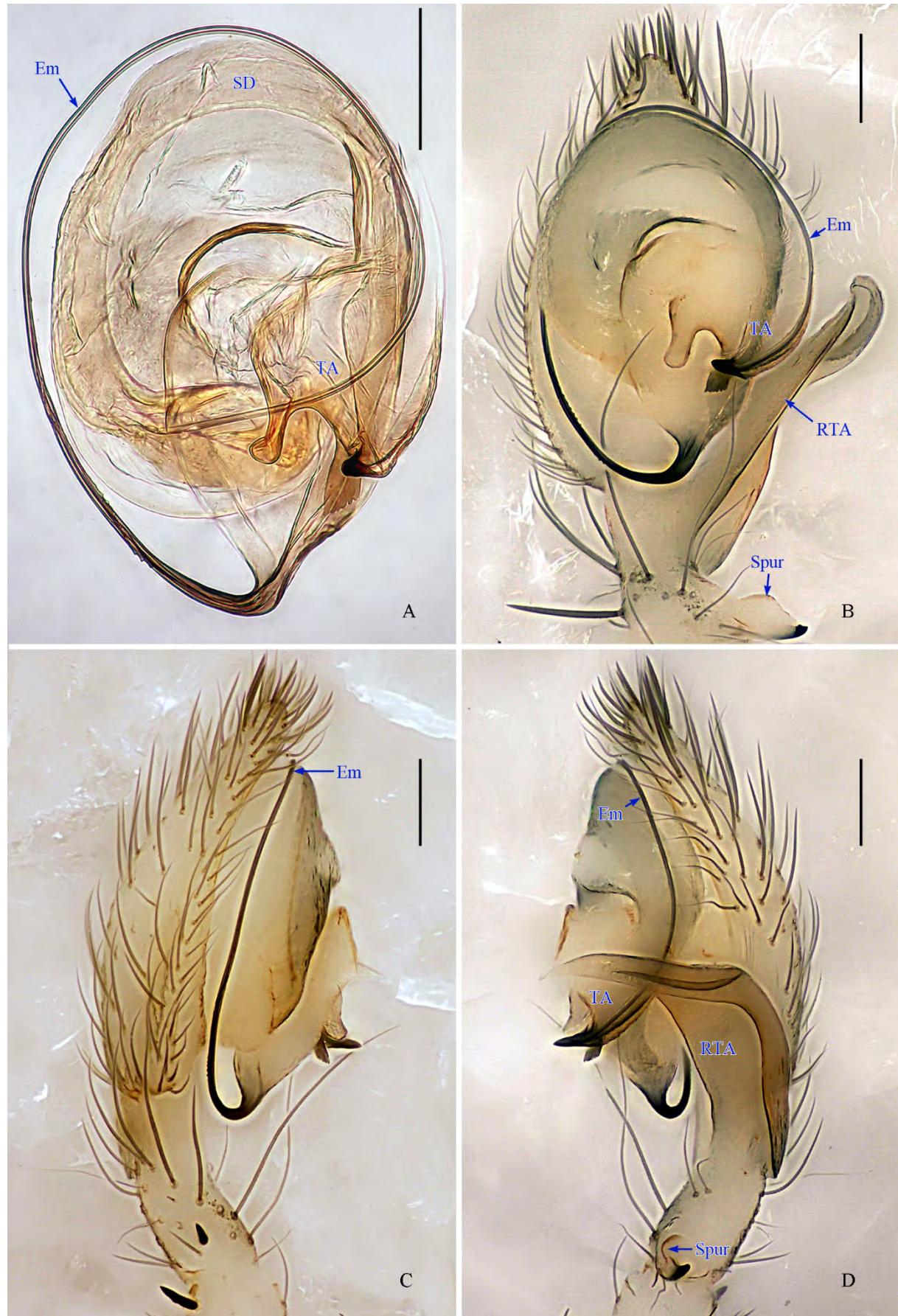


Figure 48. *Brommella tongyanfengi* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

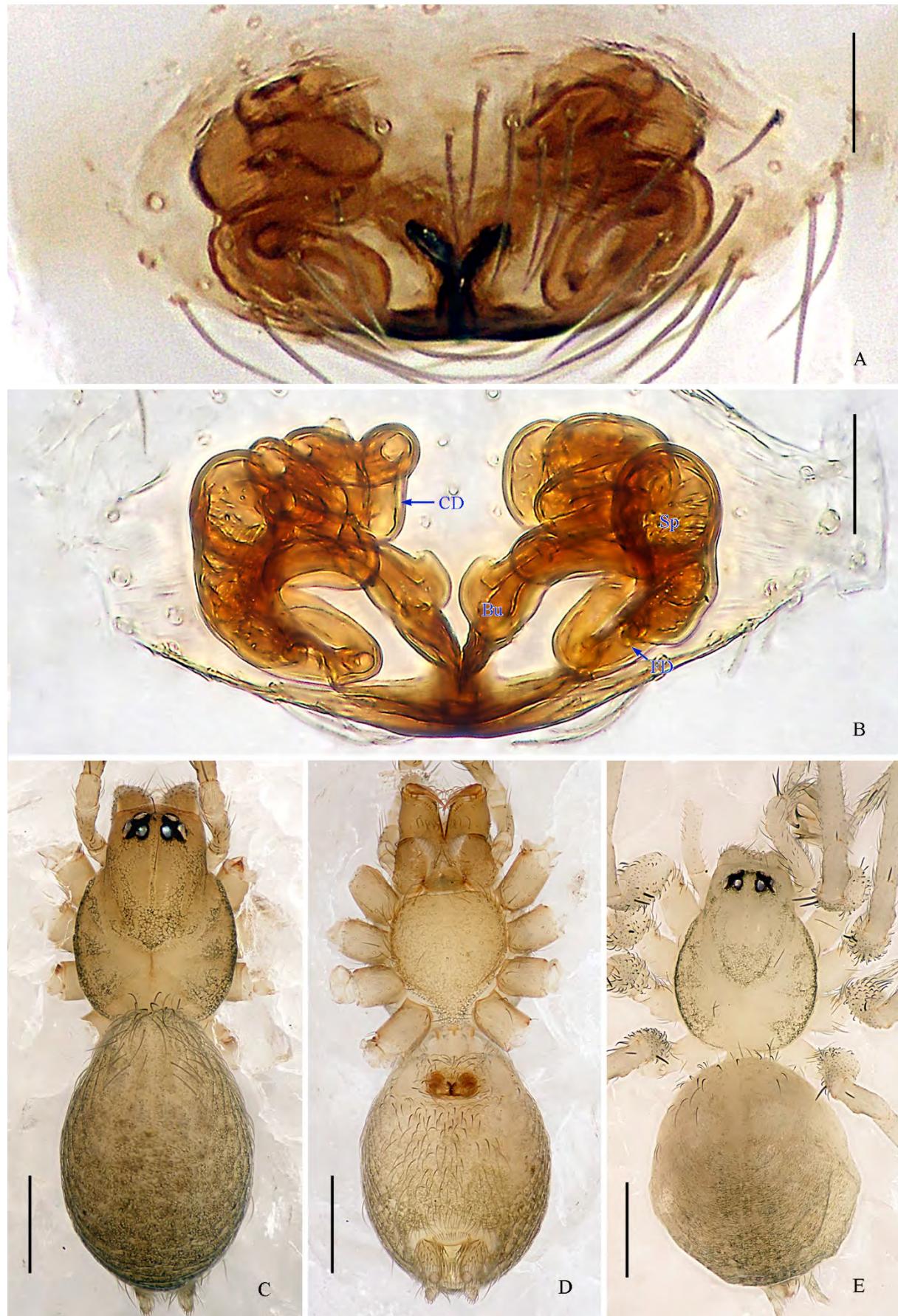


Figure 49. *Brommella tongyanfengi* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–E=0.5 mm.

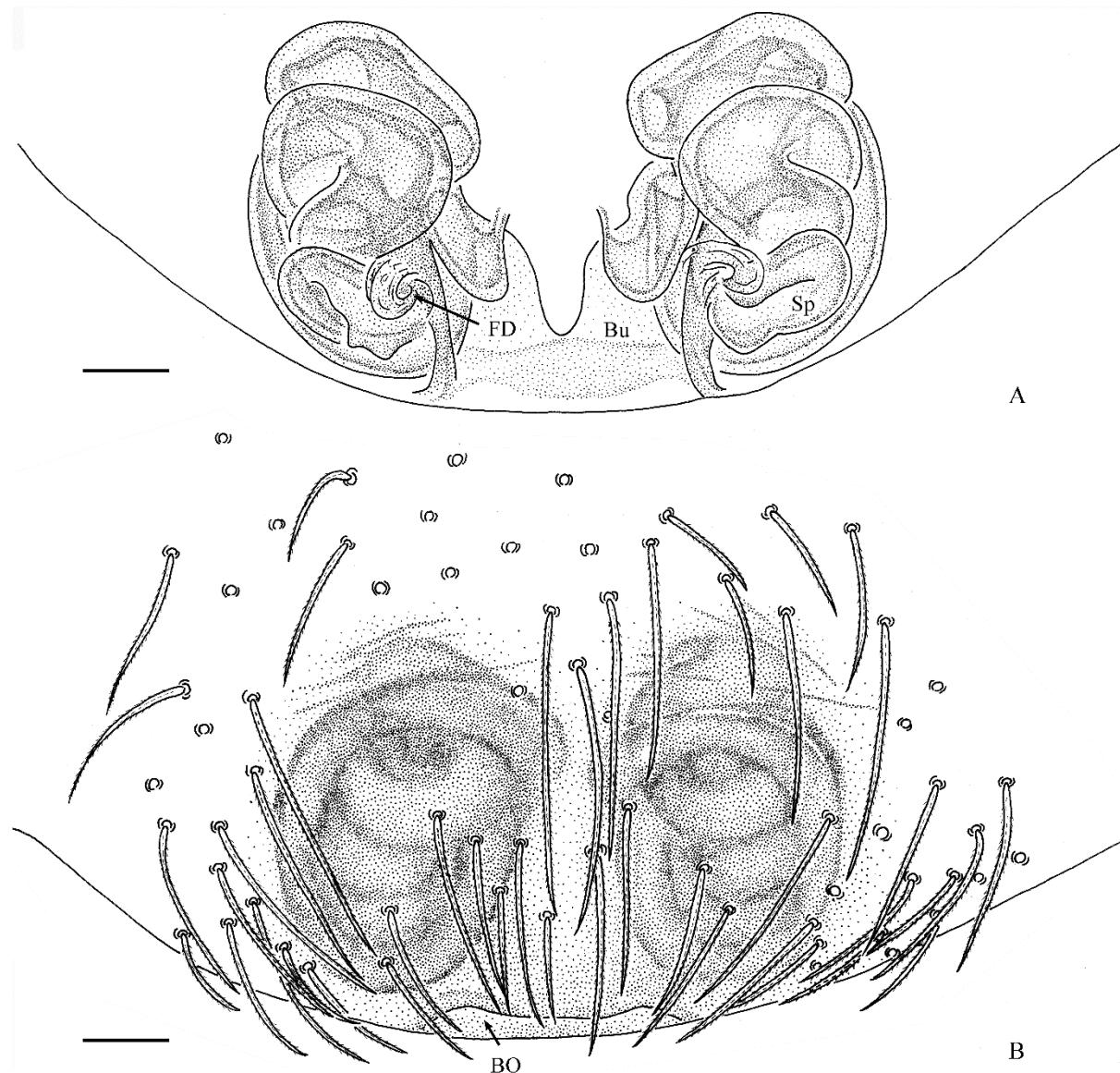


Figure 50. *Brommella wangfengcheni* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

Description. Female (holotype). Total length 2.95 (Figs 51C–D). Prosoma length 1.35, width 1.00. Cephalic region width 0.58. Carapace pyriform, cephalic part flat, covered with several setae. Thoracic part yellow, fovea reduced. Eight eyes, AME black, others white, all eyes encircled with black. Eye size and interdistances: AME 0.04, ALE 0.09, PLE 0.09, PME 0.08; ALE-PLE 0.02, PLE-PME 0.06, PME-PME 0.07, ALE-AME 0.01, AME-AME 0.03. Eye region length 0.20, width 0.39. Clypeus height 0.14. Chelicerae length 0.54, width 0.28. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Chelicerae, labium and gnathocoxae light brown; sternum yellow. Labium length 0.18, width 0.25. Gnathocoxae length 0.43, width 0.21. Sternum length 0.80, width 0.73. Legs light brown. Leg formula I-IV-II-III. Leg measurements: I 7.05 (2.00, 0.60, 1.90, 1.62, 0.93); II 5.33 (1.60, 0.50, 1.35, 1.10, 0.78); III 4.52 (1.44, 0.45, 1.05, 0.93, 0.65); IV 6.18 (1.80, 0.50, 1.50, 1.50, 0.88). Ratio Cl/Met IV=0.25, with 12 setae. Opisthosoma length 1.75, width 1.30. Opisthosoma white, without any spots. Cribellum narrow, undivided.

Epigynum (Figs 50, 51A–B). Width 0.36. Atrium situated posteriorly of epigynal plate, touching the epigastric furrow. Copulatory ducts coiled as two loops in ventral view. Bursae enlarged, fused at base. Copulatory ducts thick, tightly twisted. The spermathecae small, transversely swollen.

Male. Unknown.

Distribution. Known only from the type locality (Fig. 97).

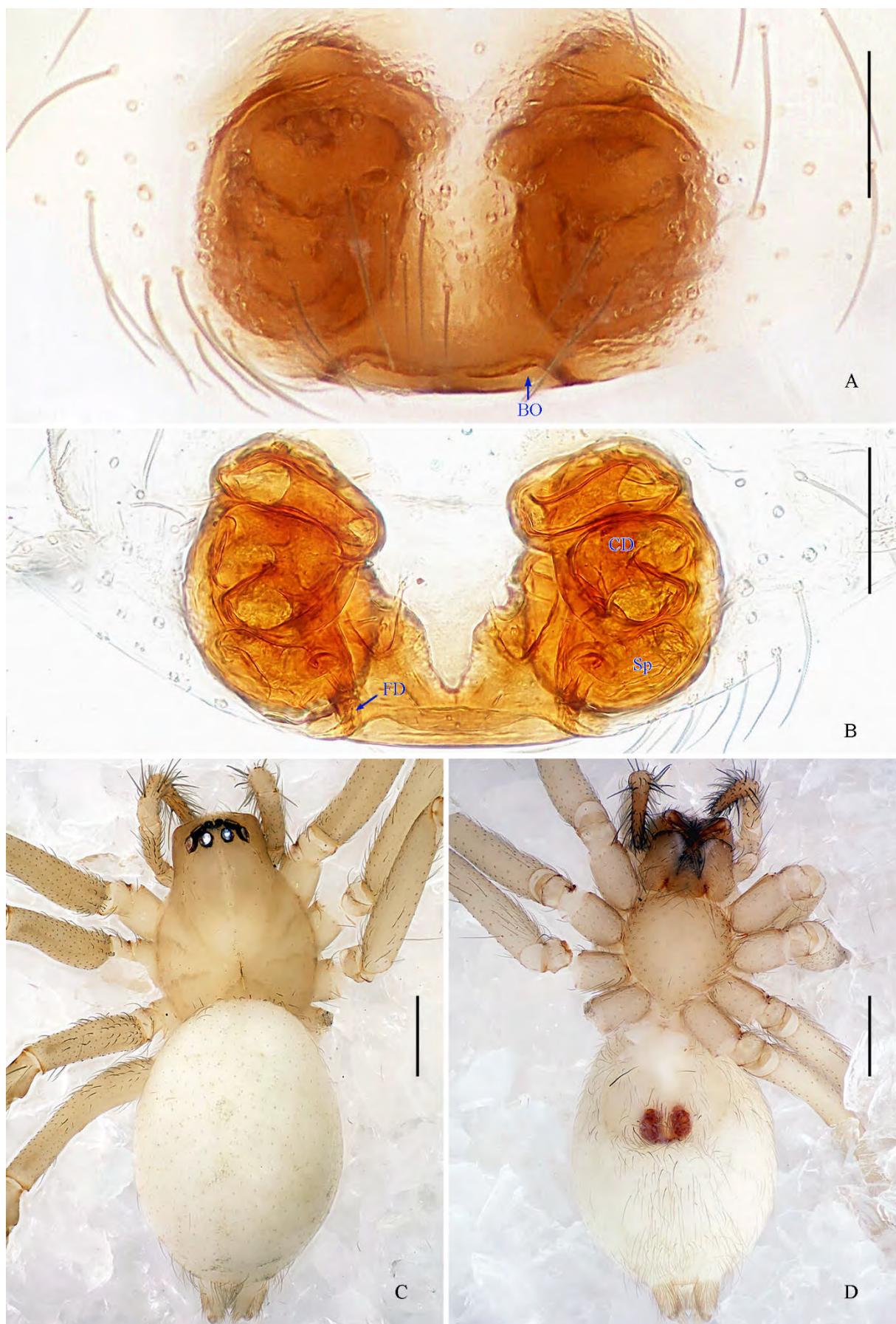


Figure 51. *Brommella wangfengcheni* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–D=0.5 mm.

***Brommella xinganensis* Li, sp. nov.** (Figs 52–56, 97)

Type material. Holotype. Male, China, Guangxi, Guilin City, Xing'an County, Rudongyan Village, Rudongyan Cave, 25°34.437'N, 110°37.237'E, elev. 225 m, 9 October 2010, X. Wang & L. Lin leg., deposited in IZCAS. Paratypes. 1 male, 12 females, same data as holotype, deposited in IZCAS.



Figure 52. *Brommella xinganensis* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

**Etymology.** The specific name refers to the type locality; adjective.

**Diagnosis.** This new species is similar to *B. punctosparsa* (Song, Zhu & Chen, 1999: 363, figs 213K–N), but can be distinguished by the 8-o'clock position of the embolus base (embolus originating at 5-o'clock position in *B. punctosparsa*), the conical medial apophysis (obtuse triangle in *B. punctosparsa*), and the relatively jumbled copulatory ducts in ventral view (copulatory ducts in coils in *B. punctosparsa*).

**Description.** Male (holotype). Total body length 1.80 (Fig. 56E). Prosoma length 0.85, width 0.68. Cephalic region width 0.43. Cephalic part relatively flat, yellow, darker than thoracic part, covered with several setae. Prosoma margin black, with several radical stripes on the cephalothorax, fovea reduced. Six eyes, AME reduced to small pigment spots, all eyes white, encircled with black. PER straight. Eye diameters: ALE 0.07, PLE 0.08, PME 0.06. Eye interdistances: ALE-PLE

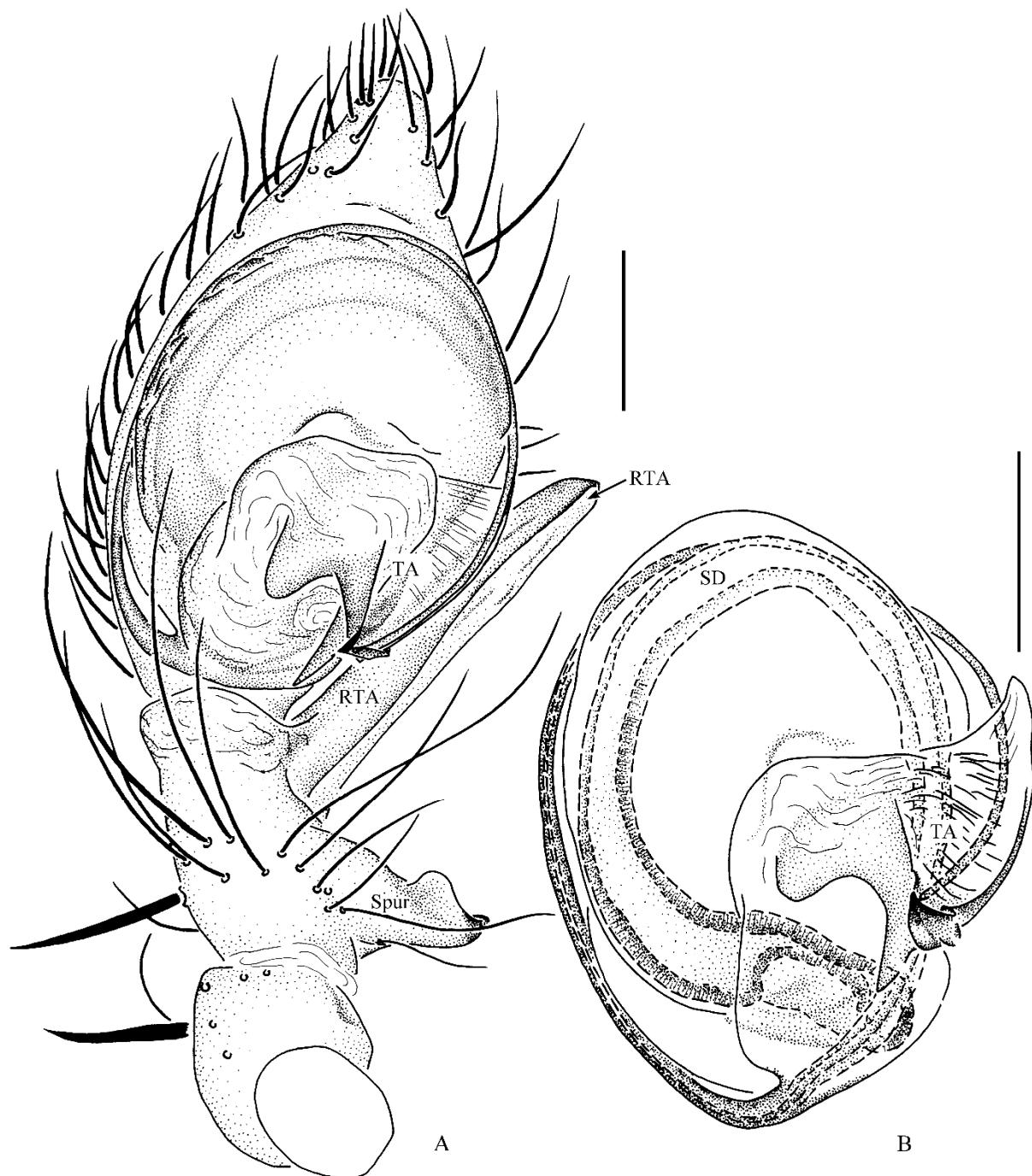


Figure 53. *Brommella xinganensis* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

0.02, PLE-PME 0.04, PME-PME 0.06, ALE-ALE 0.08. Eye region length 0.15, width 0.31. Clypeus height 0.09. Chelicerae length 0.28, width 0.19. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Chelicerae light brown, labium and gnathocoxae light brown; sternum yellow. Labium length 0.10, width 0.18. Gnathocoxae length 0.28, width 0.16. Sternum length 0.53, width 0.48. Legs yellow. Leg formula I-IV-II-III. Leg measurements: I 3.78 (1.10, 0.35, 1.00, 0.80, 0.53); II 3.18 (0.90, 0.33, 0.75, 0.70, 0.50); III 2.84 (0.83, 0.28, 0.63, 0.65, 0.45); IV 3.46 (1.00, 0.33, 0.83, 0.80, 0.50). Ratio Cl/Met IV=0.30, with 8 setae. Opisthosoma length 0.95, width 0.40. Opisthosoma white, without distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 52–53, 55). Cymbium 0.20 long. Embolus long, filiform, originated at approximately 8-o'clock position. TA prolaterally short and simple; the prolateral apophysis conical, with blunt end. TA retrolateral large, with pointed apex, simple, with a single fold. Base of tibia with a big bifurcated spur.

Female (one of the paratypes). Total body length 2.10 (Figs 56C–D). Prosoma length 0.90, width 0.70. Cephalic region width 0.43. Prosoma margin indistinct. Eye diameters: ALE 0.08, PLE 0.08, PME 0.05. Eye interdistances: ALE-PLE 0.02, PLE-PME 0.04, PME-PME 0.07, ALE-ALE 0.08. Eye region length 0.15, width 0.30. Clypeus height 0.08. Chelicerae length 0.40, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 4 retromarginal teeth. Labium length 0.11, width 0.18. Gnathocoxae length 0.25, width 0.16. Sternum length 0.55, width 0.42. Leg formula I-IV-II-III. Leg

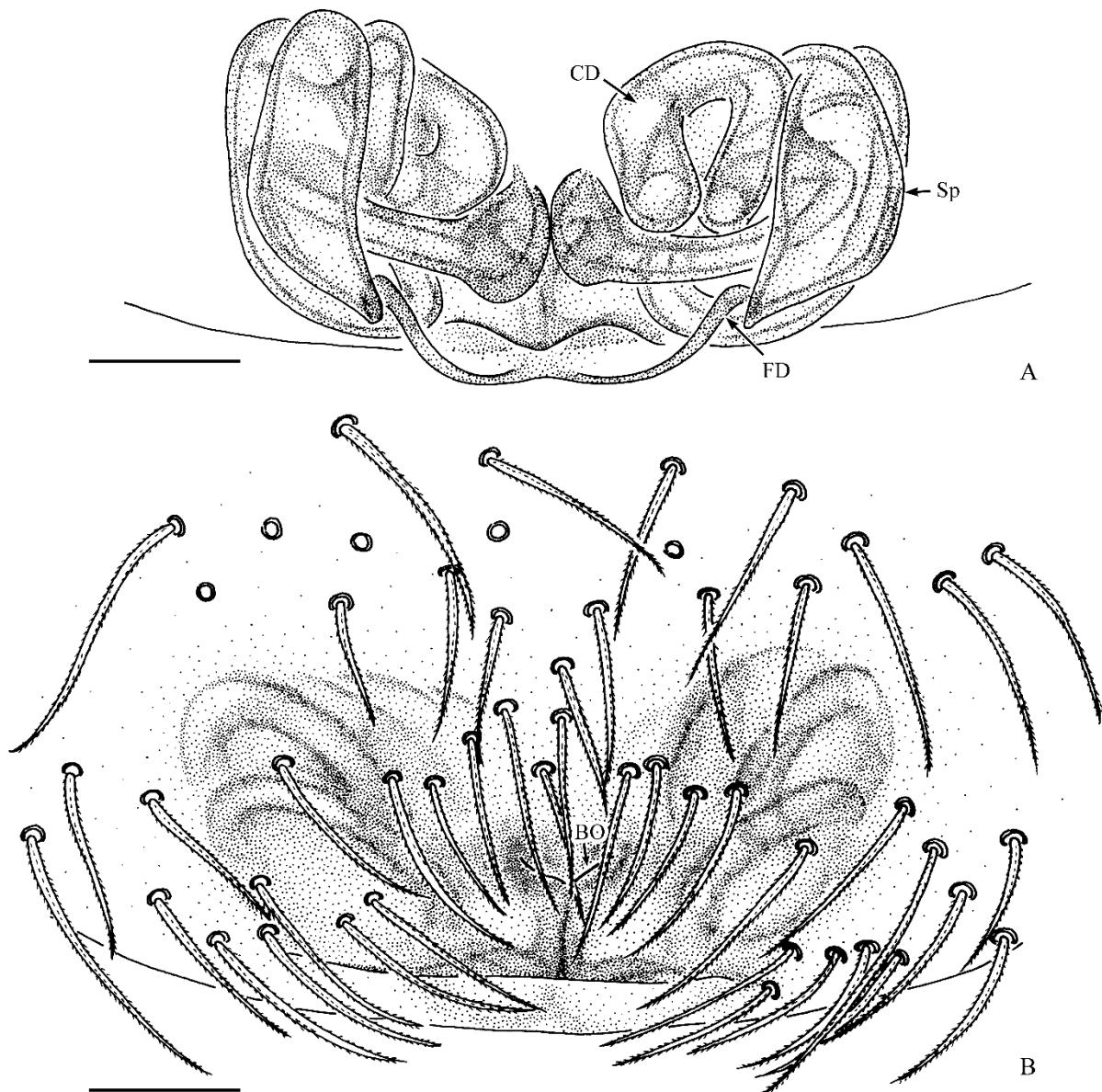


Figure 54. *Brommella xinganensis* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

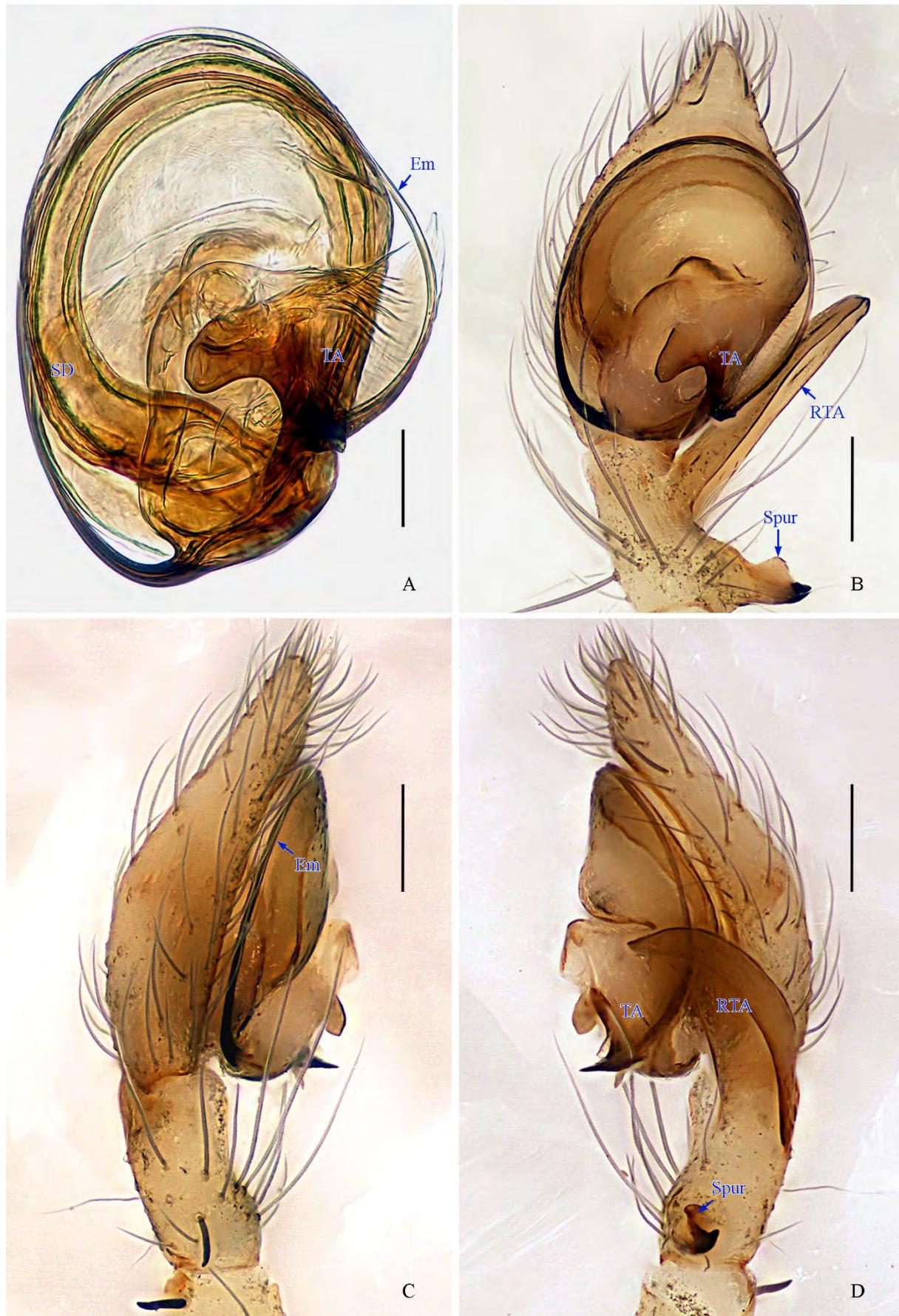


Figure 55. *Brommella xinganensis* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

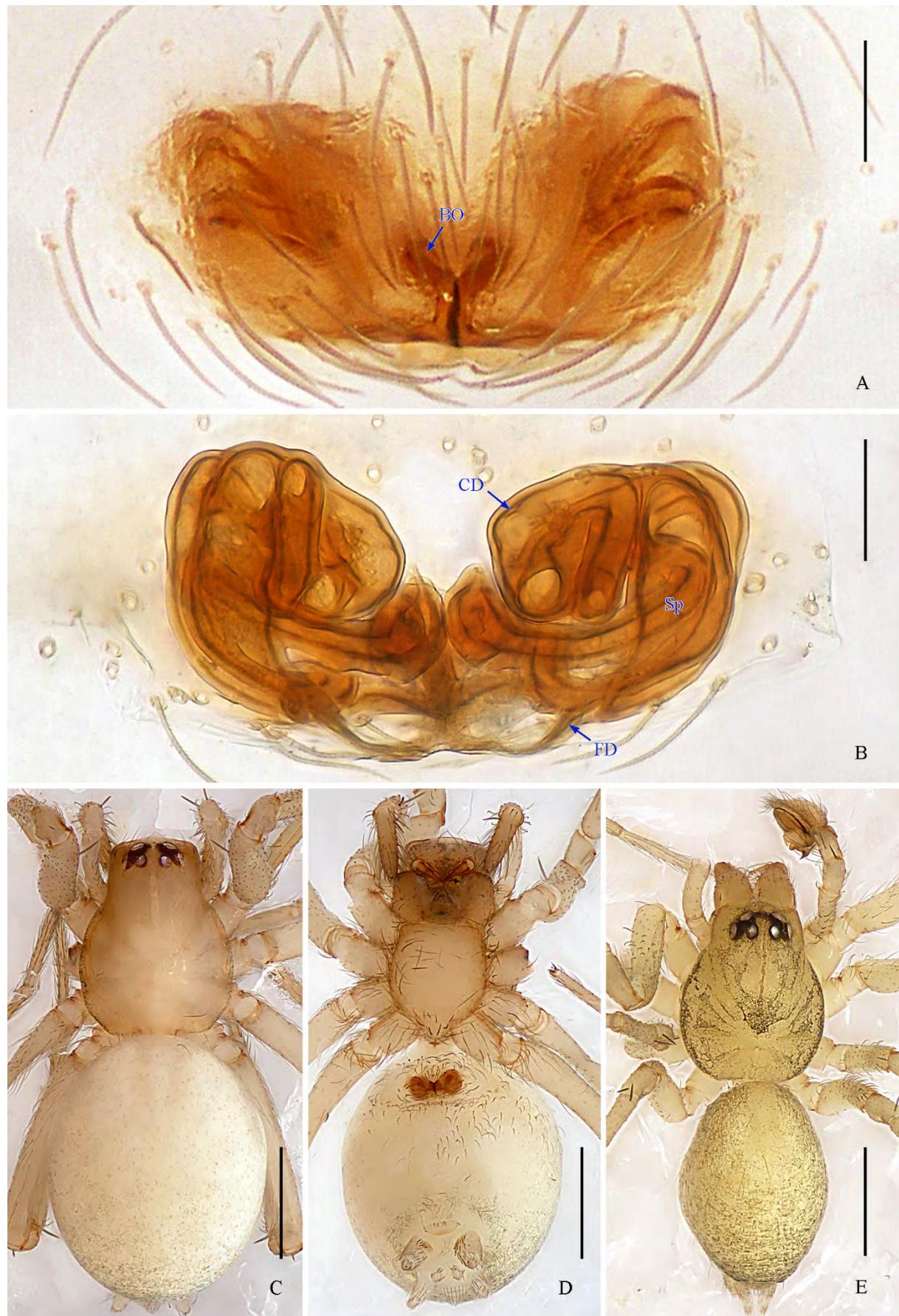


Figure 56. *Brommella xinganensis* Li, sp. nov. A–D. Paratype, female. E. holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–E=0.5 mm.

measurements: I 3.23 (0.95, 0.33, 0.80, 0.70, 0.45); II 2.78 (0.85, 0.30, 0.60, 0.63, 0.40); III 2.53 (0.75, 0.30, 0.55, 0.55, 0.38); IV 3.20 (0.95, 0.30, 0.75, 0.75, 0.45). Ratio Cl/Met IV=0.43, with 8 setae. Opisthosoma length 1.25, width 1.00.

Epigynum (Figs 54, 56A–B). Width 0.23. BO small and close. Bursae reduced. Copulatory ducts slender, twisted tightly (Figs 54A, 56B). Part of spermathecae slightly swollen, “C”-shaped.

Variation. Total body length: males 1.8–1.9 ( $n=2$ ), females 1.9–2.35 ( $n=12$ ).

Distribution. Known only from the type locality (Fig. 97).

***Brommella yizhouensis* Li, sp. nov. (Figs 57–61, 97)**

Type material. Holotype. Male, China, Guangxi, Yizhou City, Huixianshan Mountain Scenic Spot, Bailong Cave, 24°30.322'N, 108°39.888'E, elev. 221 m, 27 July 2009, C. Wang & Z. Yao leg., deposited in IZCAS. Paratypes. 17 females,



Figure 57. *Brommella yizhouensis* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

same data as holotype, deposited in IZCAS.

**Etymology.** The specific name refers to the type locality; adjective.

**Diagnosis.** This new species is similar to *B. punctosparsa* (Song, Zhu & Zhang, 1999: 363, figs 213K–N), but can be distinguished by the details of its pedipalpus and epigynum.

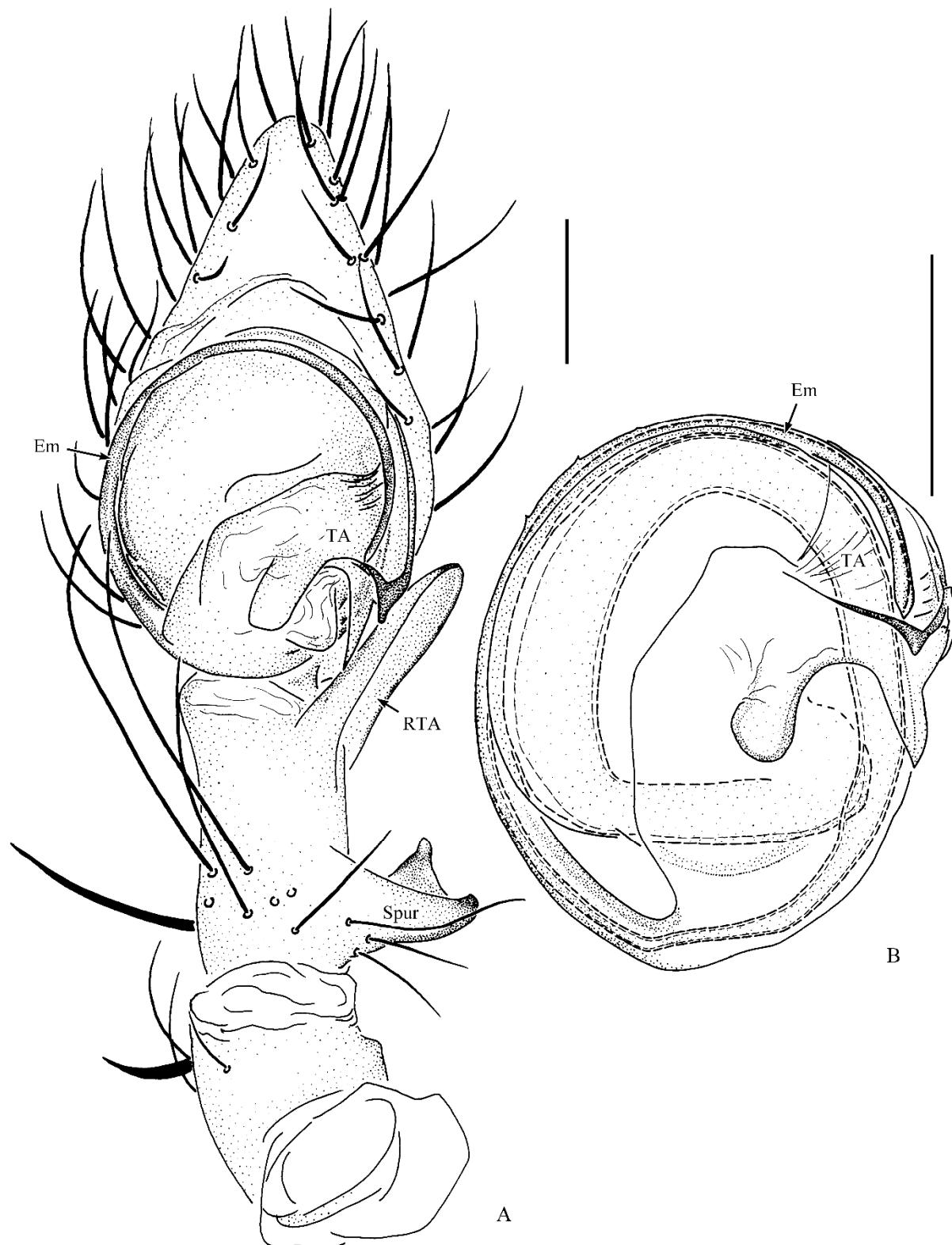


Figure 58. *Brommella yizhouensis* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

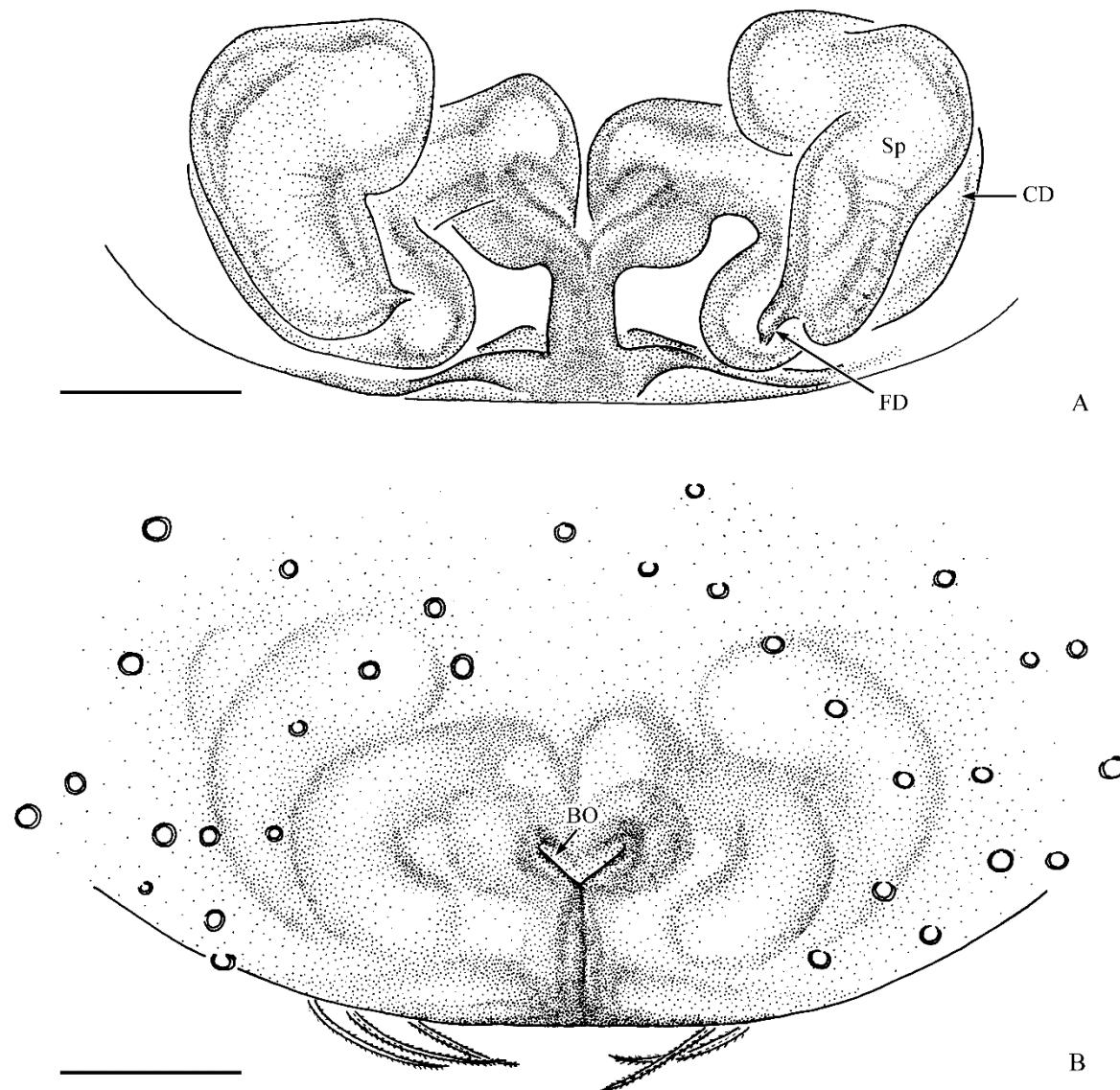


Figure 59. *Brommella yizhouensis* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

**Description.** Male (holotype). Total body length 2.10 (Fig. 61E). Prosoma length 0.95, width 0.75. Cephalic region width 0.43. Cephalic part relatively flat, white, covered with several setae. Thoracic part white, fovea reduced. Prosoma margin indistinct. Six eyes, AME absent, all eyes white, encircled with black. Eye diameters: ALE 0.06, PLE 0.06, PME 0.03. Eye region length 0.13, width 0.29. Eye interdistances: ALE-PLE 0.01, PLE-PME 0.04, PME-PME 0.08, ALE-ALE 0.10. Clypeus height 0.12. Chelicerae length 0.39, width 0.19. Chelicerae with distinct lateral condyles, 3 promarginal and 5 retromarginal teeth. Chelicerae, labium and gnathocoxae yellow; sternum white. Labium length 0.11, width 0.20. Gnathocoxae length 0.33, width 0.18. Sternum length 0.46, width 0.50. Legs white. Leg formula I-IV-II-III. Leg measurements: I 4.56 (1.25, 0.38, 1.25, 1.00, 0.68); II 3.98 (1.10, 0.33, 1.00, 0.90, 0.65); III 3.43 (1.05, 0.33, 0.70, 0.80, 0.55); IV 4.29 (1.20, 0.38, 0.98, 1.08, 0.65). Ratio Cl/Met IV = 0.23, with 5 setae. Opisthosoma length 1.18, width 0.95. Opisthosoma white, without distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 57–58, 60). Cymbium 0.39 wide. Embolus long, filiform, originating at approximately 9-o'clock position. TA prolaterally short and simple. Prolateral part of TA with a short finger-shaped projection. RTA large, simple, with a single fold, apical end of RTA pointed. Base of tibia with a large bifurcated spur, superior branch with forked apex.

Female (one of the paratypes). Total body length 2.43 (Figs 61C–D). Prosoma length 1.00, width 0.73. Cephalic region width 0.45. Eye diameters: ALE 0.06, PLE 0.07, PME 0.05. Eye interdistances: ALE-PLE 0.01, PLE-PME 0.03, PME-PME 0.07, ALE-ALE 0.10. Eye region length 0.14, width 0.29. Clypeus height 0.11. Chelicerae length 0.40, width 0.20. Chelicerae with distinct lateral condyles, 3 promarginal and 6 retromarginal teeth. Labium length 0.13, width 0.20.

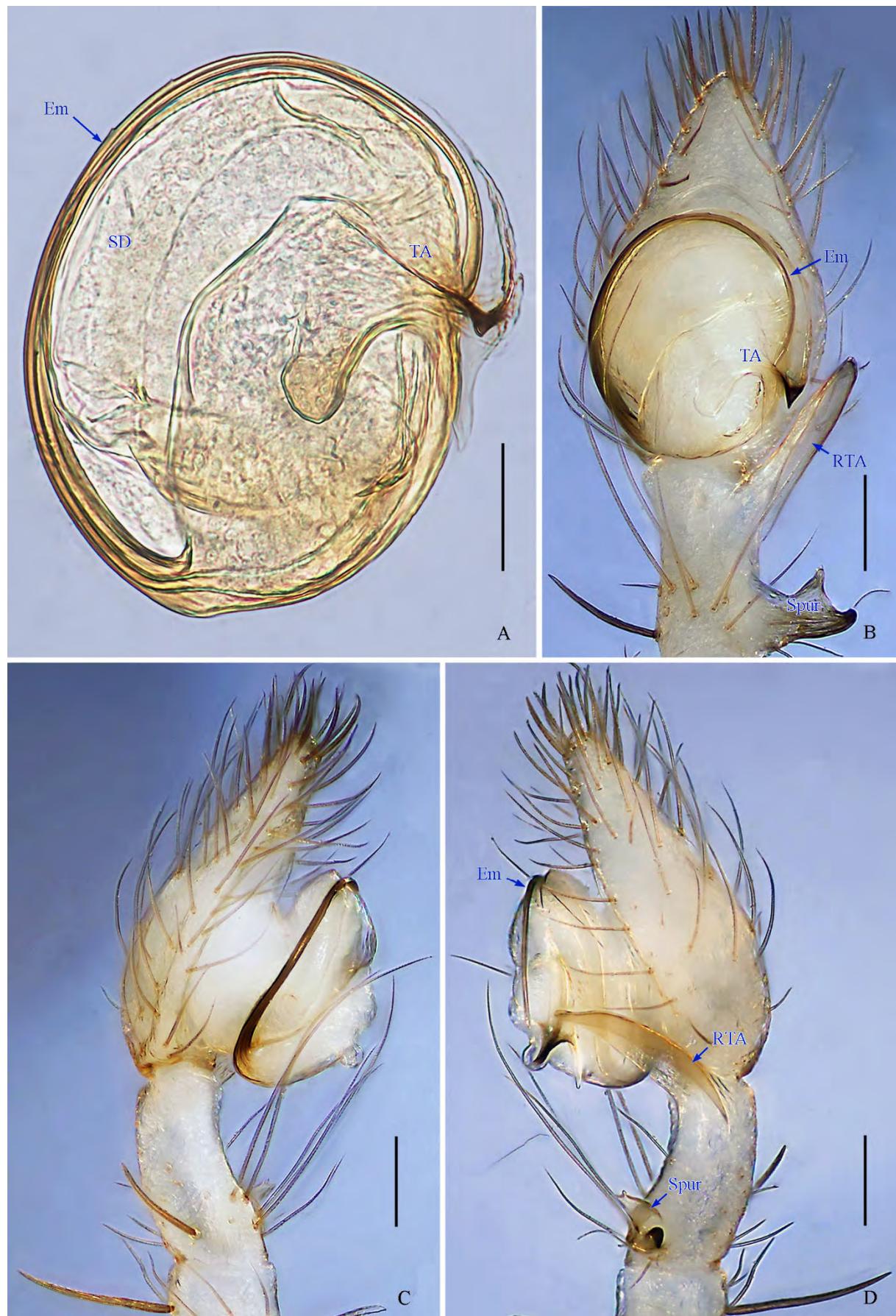


Figure 60. *Brommella yizhouensis* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars: A=0.05 mm; B-D=0.1 mm.

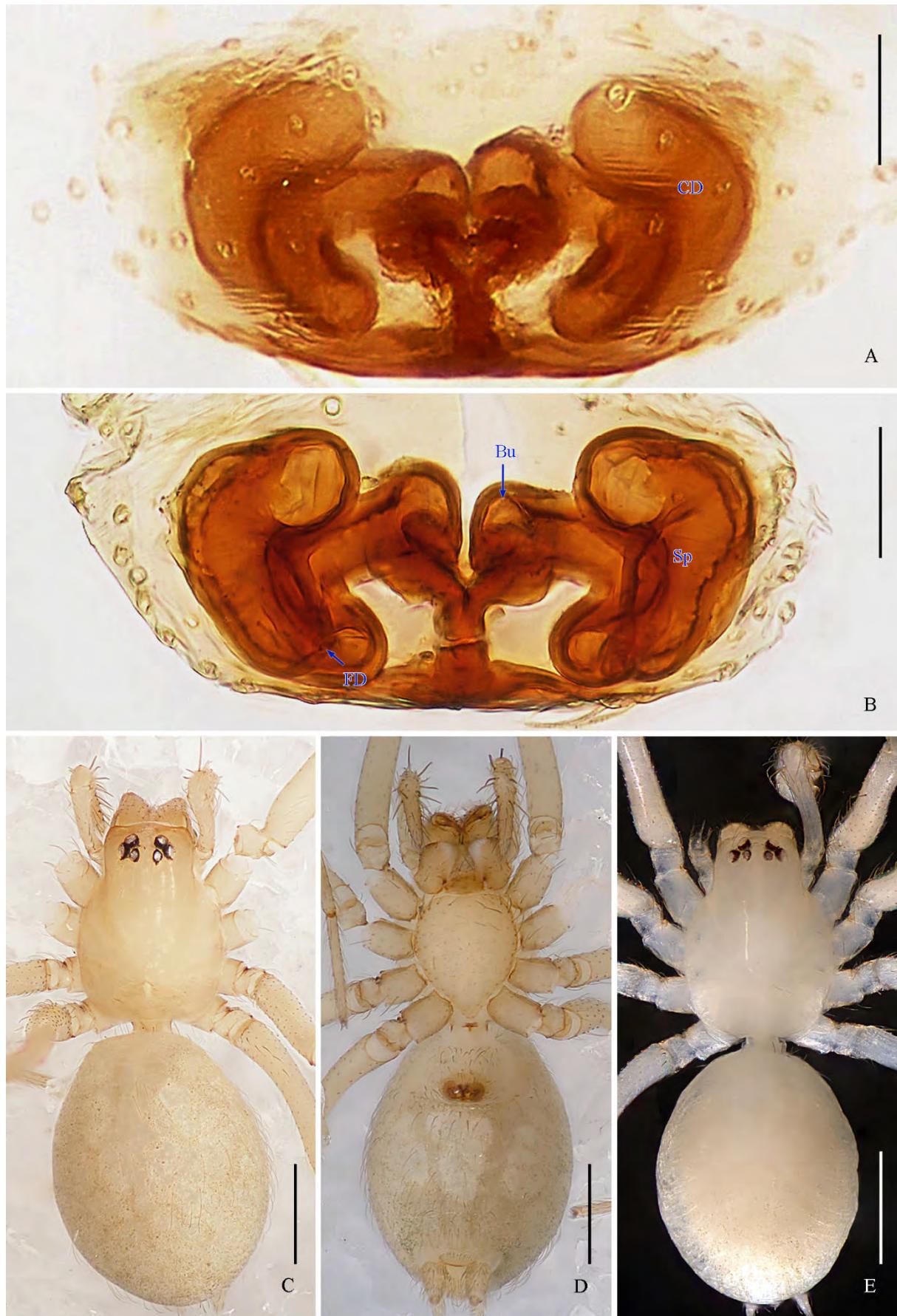


Figure 61. *Brommella yizhouensis* Li, sp. nov., A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B = 0.05 mm; C–E = 0.5 mm.

Gnathocoxae length 0.34, width 0.18. Sternum length 0.65, width 0.53. Leg formula I-IV-II-III. Leg measurements: I 4.28 (1.25, 0.43, 1.10, 0.90, 0.60); II 3.53 (1.00, 0.40, 0.83, 0.75, 0.55); III 3.20 (0.90, 0.35, 0.70, 0.75, 0.50); IV 4.23 (1.25, 0.38, 1.00, 1.00, 0.60). Ratio Cl/Met IV=0.25, with 12 setae. Opisthosoma length 1.40, width 1.10. Opisthosoma beige, without distinct pattern.

Epigynum (Figs 59, 61A–B). Width 0.22. Lune shaped copulatory ducts can be seen in ventral view. Bursae reduced. Copulatory ducts relatively short and thick. Part of spermathecae slightly swollen, “7”-shaped (Figs 59A, 61B).

Variation. Total body length: females: 2.5–3.2 ( $n=17$ ).

Distribution. Known only from the type locality (Fig. 97).

### 3.2 Genus *Cicurina* Menge, 1871

*Cicurina* Menge, 1871: 271–272. Type species: *Aranea cicurea* Fabricius, 1793 (=*Cicurina cicur* (Fabricius, 1793)).

#### *Cicurina avicularia* Li, sp. nov. (Figs 62–66, 97)

Type material. Holotype. Male, China, Guizhou, Bijie City, Hezhang County, Yemachuan Town, Nanchong Village, cave without name, 27°08.080'N, 104°48.883'E, elev. 1486 m, 15 November 2011, Z. Zha & Z. Chen leg., deposited in



Figure 62. *Cicurina avicularia* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

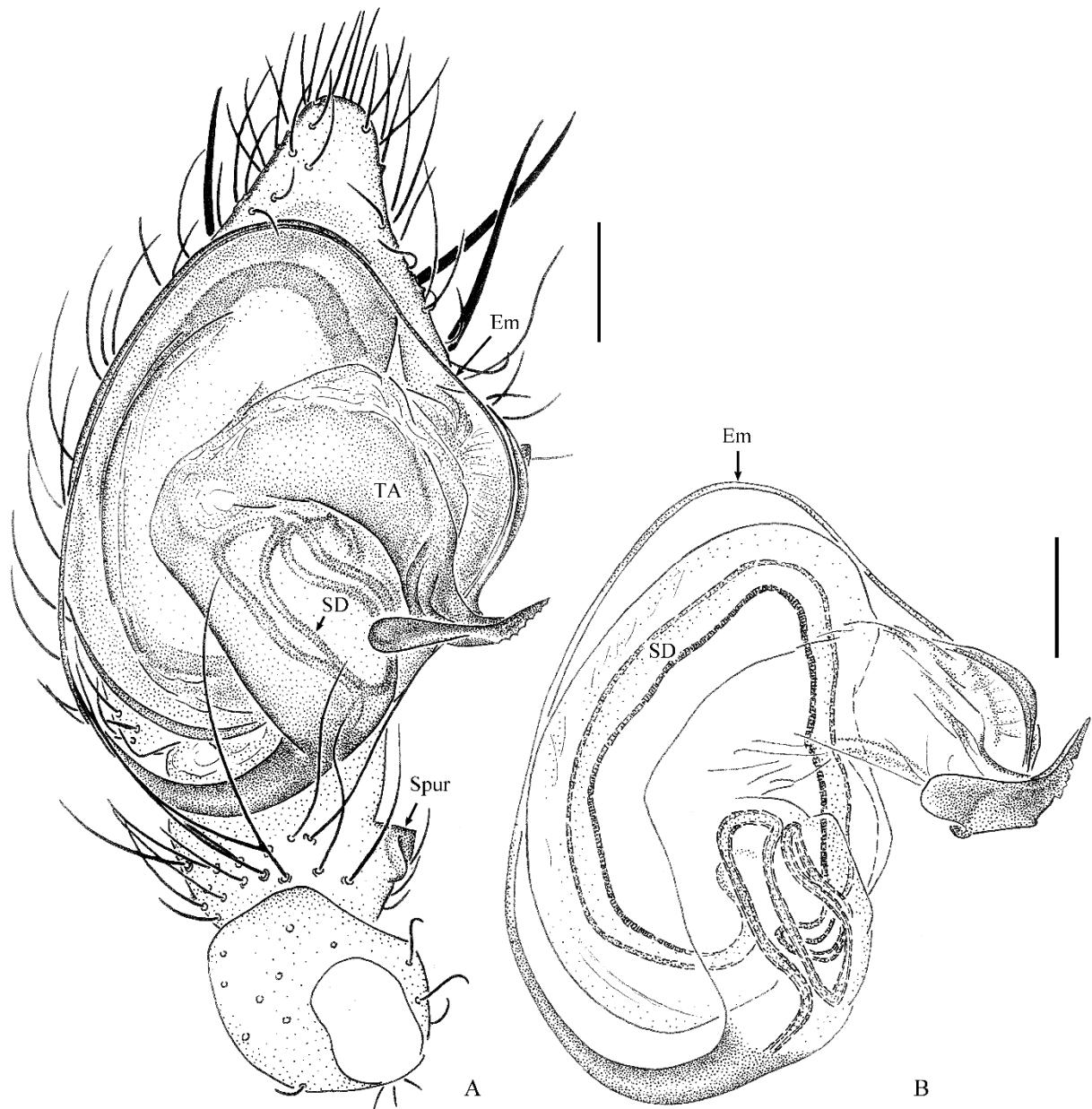


Figure 63. *Cicurina avicularia* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

IZCAS. Paratype. 1 female, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is derived from the Latin word “*avicularius*”, meaning “of birds”, and refers to the shape of TA; adjective.

**Diagnosis.** Male of this new species closely resembles those of *C. kailiensis* Li, sp. nov. (Figs 73–74, 76), but can be distinguished by the prolateral margin of TA with a tongue-shaped apophysis (lacking apophysis in *C. kailiensis* Li, sp. nov.), embolus originated at approximately 6-o'clock position (originated at approximately 9-o'clock position in *C. kailiensis* Li, sp. nov.), and the apical end of RTA pointed and with 2 setae (apical end blunt and with 1 seta in *C. kailiensis* Li, sp. nov.). Female genitalia similar to *C. dong* Li, sp. nov. (Figs 69, 71), but can be distinguished by the posteriorly located BO (anteriorly located in *C. dong* Li, sp. nov.), the part of laterally extending copulatory ducts “C”-shaped coiled (straight in *C. dong* Li, sp. nov.).

**Description.** Male (holotype). Total length 2.43 (Fig. 66E). Prosoma length 1.24, width 0.98. Cephalic region width 0.53. Prosoma ovate. Dorsal shield of prosoma yellow, with flat cephalic area, fovea reduced, cervical groove indistinct.

Eight eyes, AME black, others white, all eyes encircled with black. PER procurved by half PME diameter. Eye diameters: AME 0.04, ALE 0.06, PLE 0.07, PME 0.05. Eye interdistances: AME-ALE 0.02, AME-AME 0.02, PLE-PME 0.04, PME-PME 0.06. Eye region length 0.14, width 0.33. Clypeus height 0.09. Chelicerae yellow-brown, length 0.54, width 0.24, with distinct lateral condyles, 3 (1 large, 2 small) promarginal and 6 retromarginal teeth. Labium yellow-brown, 0.15 long, 0.23 wide. Gnathocoxae yellow-brown, 0.30 long, 0.25 wide. Sternum yellow, 0.74 long, 0.69 wide. Legs yellow. Leg formula IV-I-II-III. Leg measurements: I 3.75 (1.10, 0.39, 0.94, 0.78, 0.54); II 3.47 (1.03, 0.38, 0.83, 0.75, 0.48); III 3.10 (0.92, 0.35, 0.65, 0.73, 0.45); IV 4.01 (1.08, 0.38, 0.95, 0.99, 0.61). Opisthosoma length 1.24, width 0.95. Opisthosoma yellow, with two rows of gray spots.

Pedipalpus (Figs 62–63, 65). Cymbium length 0.55. Apex of cymbium as long as wide. Embolus originated at approximately 6-o'clock position. Embolus slender, filiform. Teterminate of TA strongly sclerotized, relatively short, lateral margin with several denticles. Prolateral margin of TA with a tongue-shaped apophysis. RTA apical end pointed, simple,

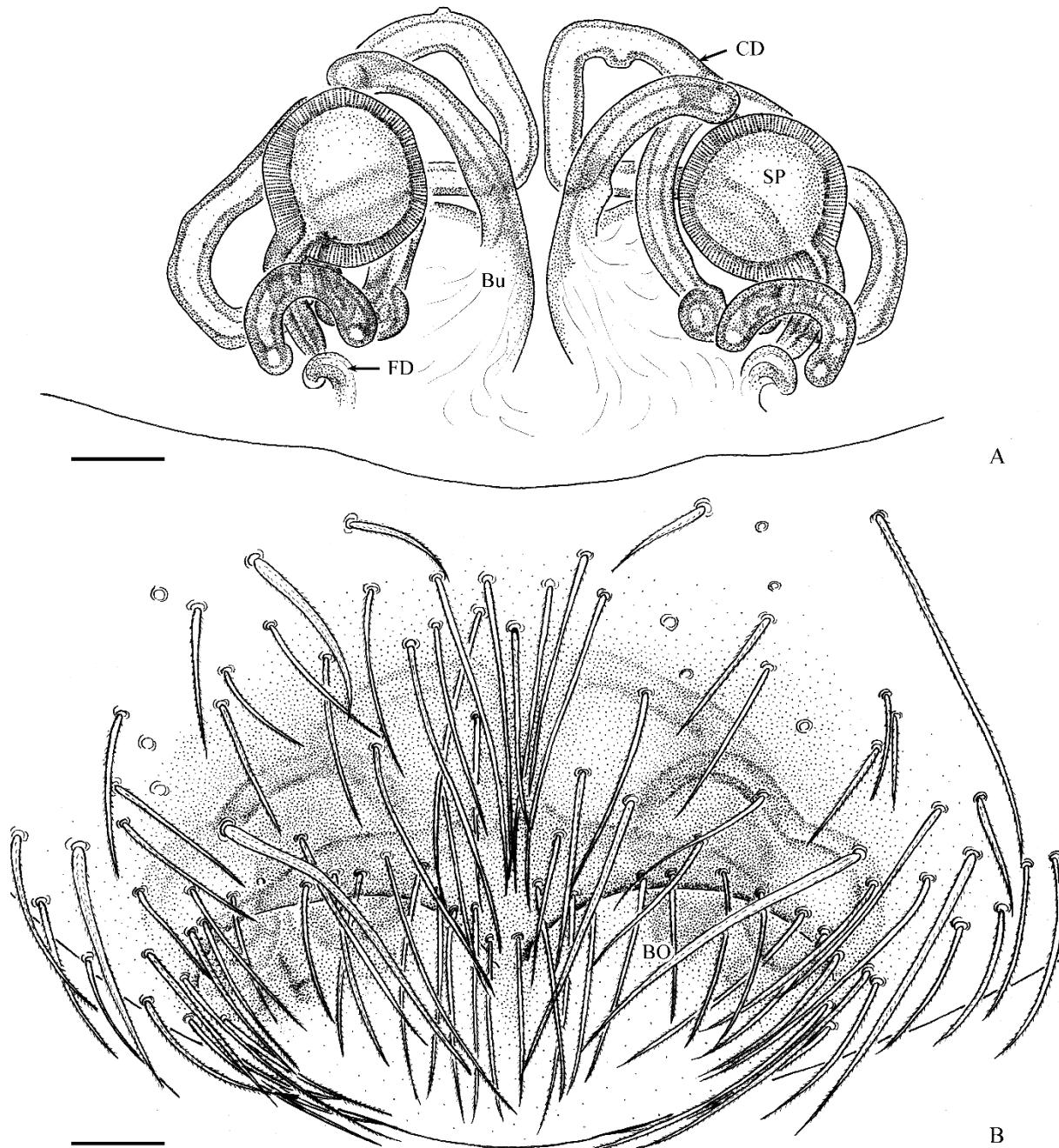


Figure 64. *Cicurina avicularia* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.05 mm.

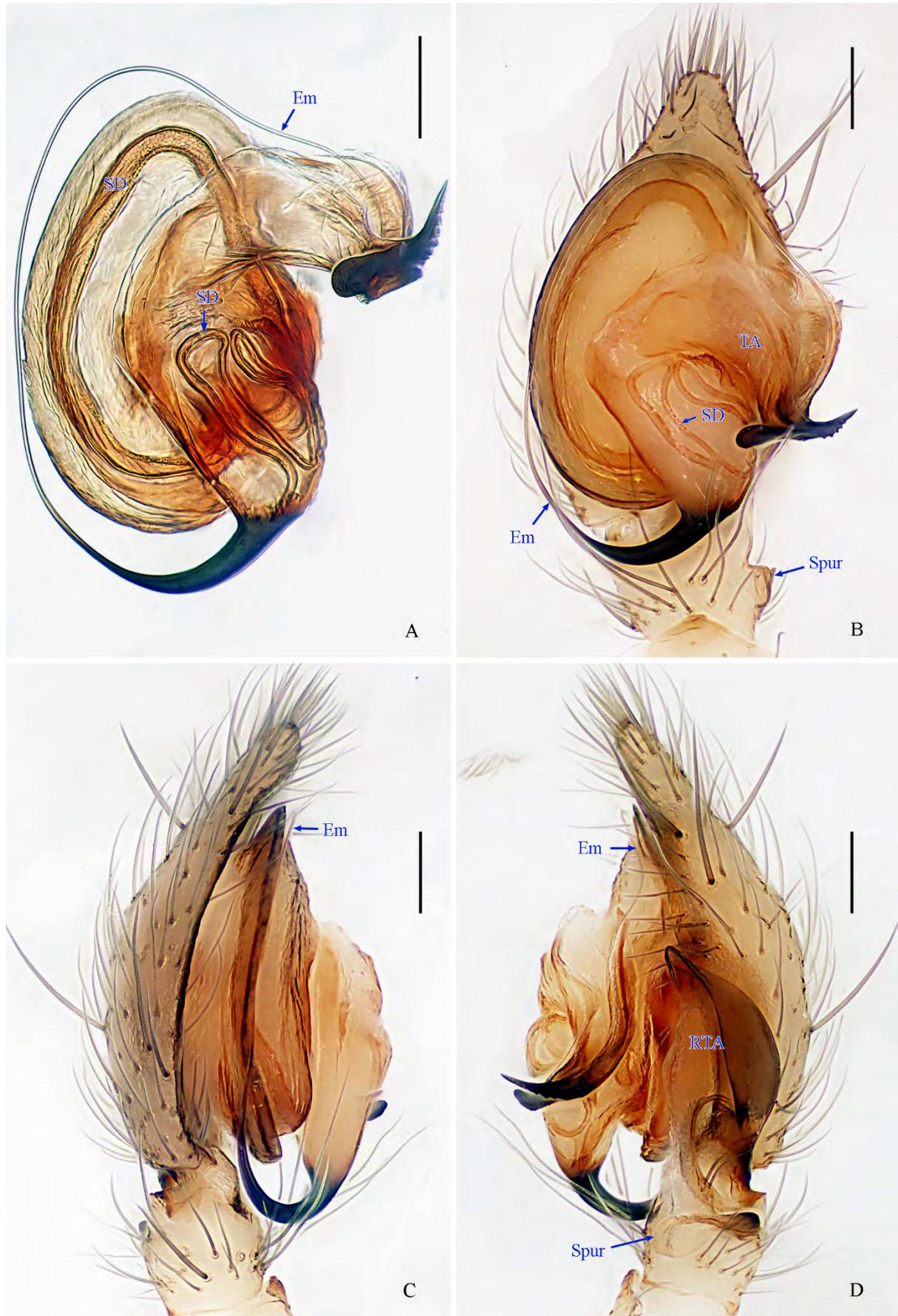


Figure 65. *Cicurina avicularia* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

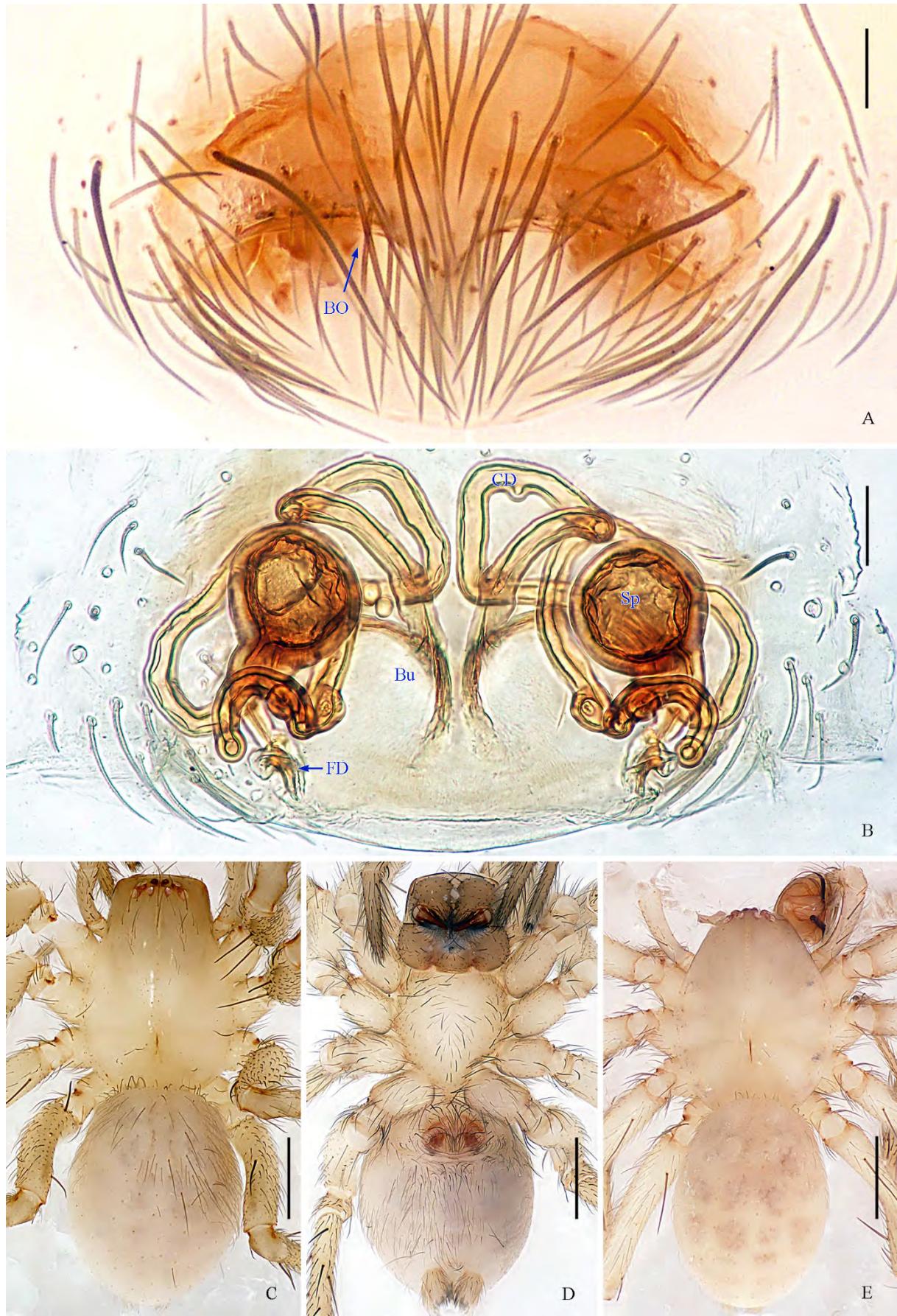


Figure 66. *Cicurina avicularia* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–E=0.5 mm.

with a single fold and with 2 setae.

Female (paratype). Total length 2.65 (Figs 66C–D). Prosoma length 1.35; width 0.98. Cephalic width 0.60. Prosoma pyriform. PER relatively straight. Eye diameters: AME 0.04, ALE 0.07, PLE 0.06, PME 0.05. Eye interdistances: AME-ALE 0.02, AME-AME 0.04, PLE-PME 0.07, PME-PME 0.08. Eye region length 0.13, width 0.36. Clypeus height 0.12. Chelicerae length 0.60, width 0.28, with distinct lateral condyles, 3 (1 large, 2 small) promarginal and 6 retromarginal teeth. Labium length 0.16, width 0.25. Gnathocoxae length 0.39, width 0.21. Sternum length 0.83, width 0.73. Leg formula IV-I-II-III. Leg measurements: I 3.97 (1.13, 0.50, 0.95, 0.86, 0.53); II 3.66 (1.08, 0.45, 0.80, 0.80, 0.53); III 3.44 (1.00, 0.39, 0.73, 0.78, 0.54); IV 4.38 (1.23, 0.45, 1.00, 1.07, 0.63). Opisthosoma length 1.38, width 1.10.

Epigynum (Figs 64, 66A–B). Width 0.39. Epigynum with large atrium, posterioly located. Bursae enlarged, not fused. Copulatory ducts hardly separated at midline. Coils forming roughly an "8". The laterally extending part of copulatory ducts "C"-shaped coiled. Spermathecae bulb-shaped, widely separated. Fertilization ducts long, laterally attached at the base of spermathecae.

Distribution. Known only from the type locality (Fig. 97).

#### *Cicurina damaoensis* Li, sp. nov. (Figs 67–68, 97)

Type material. Holotype. Female, China, Guizhou, Anshun City, Ziyun County, Houchang Town, Mazhai Village, Damao Cave, 25°29.020'N, 106°13.475'E, elev. 1410 m, 26 December 2010, H. Chen & Z. Zha leg., deposited in IZCAS.

Etymology. The specific name refers to the type locality; adjective.

Diagnosis. This new species is similar to *C. kailiensis* Li, sp. nov. (Figs 73–77), but can be distinguished by the large and inverted "U"-shaped atrium ("M"-shaped in *C. kailiensis* Li, sp. nov.), the ovate spermathecae (spheriform in *C. kailiensis* Li, sp. nov.), and the extended part of copulatory duct obviously swollen (spherical in *C. kailiensis* Li, sp. nov.).

Description. Female (holotype). Total length 2.00 (Figs 68C–D). Prosoma length 0.95, width 0.73. Dorsal shield of prosoma yellow, with flat cephalic area, cephalic region width 0.49. Fovea reduced, cervical groove indistinct. Eight eyes, AME black, others white, all eyes encircled with black. Eye diameters: AME 0.03, ALE 0.05, PLE 0.06, PME 0.04. Eye interdistances: ALE-PLE 0.01, AME-ALE 0.02, AME-AME 0.02, PLE-PME 0.04, PME-PME 0.07. Eye region length 0.12, width 0.27. Clypeus height 0.07. Chelicerae yellow-brown, 0.40 long, 0.24 wide, with distinct lateral condyles, 3 (3 large) promarginal and 7 retromarginal teeth. Labium yellow, 0.12 long, 0.19 wide. Gnathocoxae yellow, 0.28 long, 0.20 wide. Sternum light yellow, 0.62 long, 0.50 wide. Legs light yellow. Leg formula IV-I-II-III. Leg measurements: I 2.76 (0.83, 0.35, 0.65, 0.55, 0.38); II 2.63 (0.75, 0.33, 0.60, 0.55, 0.40); III 2.29 (0.65, 0.28, 0.48, 0.53, 0.35); IV 3.11 (0.85, 0.35, 0.75, 0.73, 0.43). Opisthosoma 1.10 long, 0.80 wide. No calamistrum and no cribellum.

Epigynum (Figs 67, 68A–B). Width 0.26. Epigynum with large atrium, inverted "U"-shaped. Bursae enlarged, slightly sclerotized, fused. Spermathecae ovate. Second pore large, at apex of copulatory ducts, laterally extended part of copulatory duct swollen. Fertilization duct long, medially attached at base of spermathecae.

Male. Unknown.

Distribution. Known only from the type locality (Fig. 97).

#### *Cicurina dong* Li, sp. nov. (Figs 69–72, 97)

Type material. Holotype. Male, China, Guizhou, Bijie City, Zhijin County, Chengguan Town, Yangliu Village, Long Cave, 26°40.975'N, 105°47.085'E, elev. 1323 m, 24 April 2007, Y. Lin & J. Liu leg., deposited in IZCAS. Paratypes. 2 males, 30 females, same data as holotype, deposited in IZCAS.

Etymology. The specific name is from the Chinese word for cave, in reference to the habitat of this species; noun.

Diagnosis. The male pedipalpus of this species closely resembles that of *C. medina* Gertsch, 1992 (Paquin & Dupérré, 2009: 31, figs 56–57), but can be distinguished by the presence of a finger-shaped apophysis at retrolateral margin of TA (absent in *C. medina*). Females of this species are most similar to those of *C. avicularia* Li, sp. nov. (Figs 64, 66A–D), but can be distinguished by the anteriorly situated BO (posteriorly situated in *C. avicularia* Li, sp. nov.), and the end of copulatory ducts pointing laterally (posteriorly pointing in *C. avicularia* Li, sp. nov.).

Description. Male (holotype). Total body length 2.75 (Fig. 72E). Prosoma length 1.40, width 1.26. Cephalic region width 0.65. Cephalic part relatively flat, light brown, covered with several setae. Thoracic part light brown, fovea reduced. Eight eyes, PER relatively straight as seen in dorsal view, AME smallest, black, others white. All eyes encircled with black. Eye diameters: AME 0.05, ALE 0.09, PLE 0.09, PME 0.07. Eye region length 0.18, width 0.40. Eye interdistances: AME-AME 0.02, AME-ALE 0.03, ALE-PLE 0.02, PLE-PME 0.05, PME-PME 0.10, AME-PME 0.06. Clypeus height 0.12. Chelicerae length 0.60, width 0.28. Chelicerae with distinct lateral condyles, 3 promarginal and 7 retromarginal teeth.

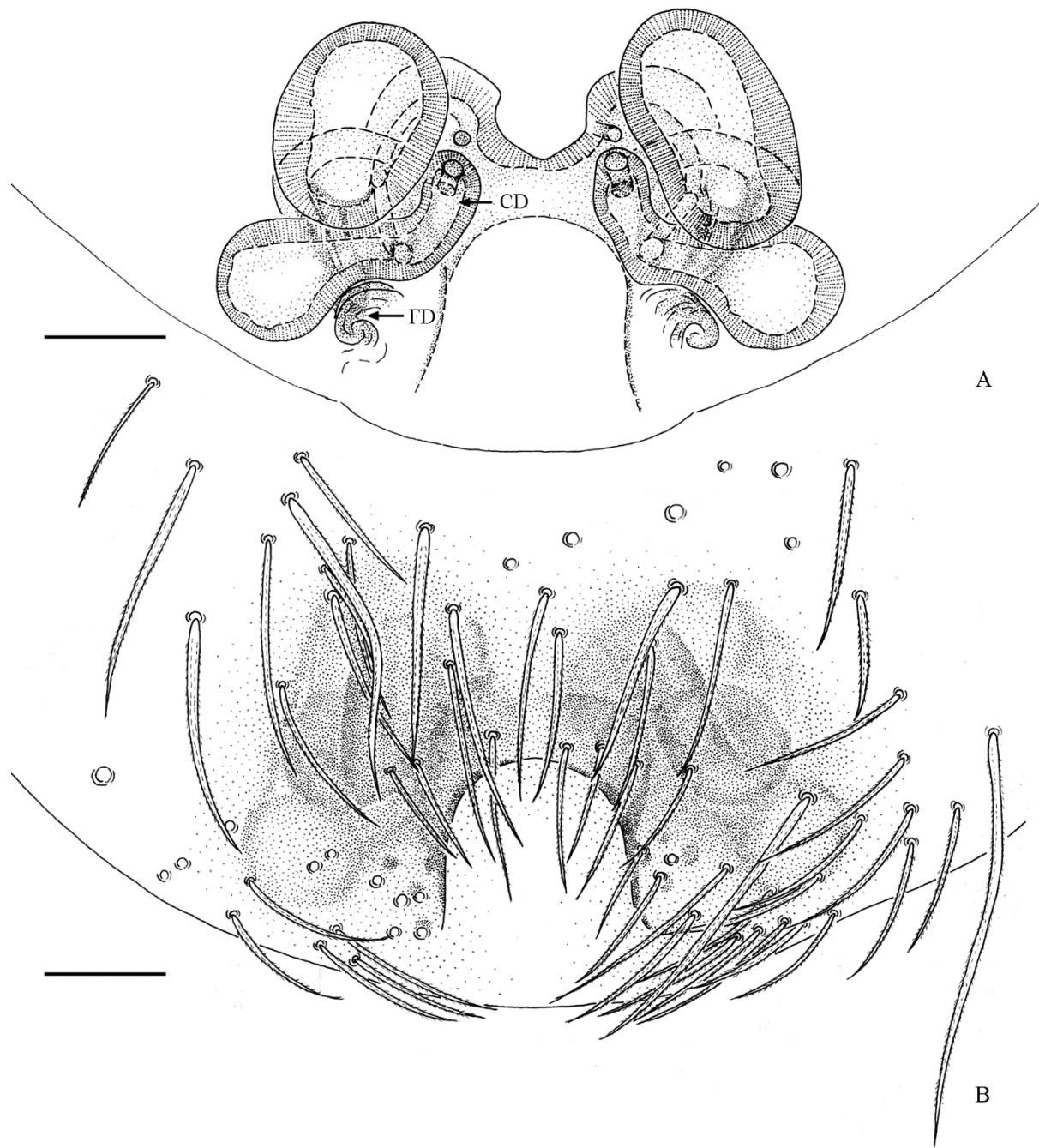


Figure 67. *Cicurina damaoensis* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.05 mm.

Labium and gnathocoxae brown, sternum light brown. Labium length 0.18, width 0.26. Gnathocoxae length 0.36, width Sternum length 0.83, width 0.83. Legs light brown. Leg formula IV-I-II-III. Leg measurements: I 4.58 (1.30, 0.55, 1.10, 0.98, 0.65); II 4.40 (1.30, 0.50, 1.00, 0.95, 0.65); III 4.08 (1.10, 0.50, 0.90, 0.98, 0.60); IV 4.90 (1.30, 0.50, 1.20, 1.25, 0.65). Opisthosoma length 1.50, width 1.05. Opisthosoma pale-yellow, with green-black pattern, venter without distinct pattern. Spinnerets yellow-brown. No cribellum and no calamistrum.

Pedipalpus (Figs 69, 71). Cymbium length 0.67. Apex of cymbium as long as wide. Embolus slender, filiform, originated at approximately 8-o'clock position. TA prolaterally, long, slim, and pointed, recurving towards base of TA, venter with row of diaphragms. Lateral of TA with a finger-shaped, coarse apophysis. TA retrolateral with two pointed fold, and with 2 setae. Spur small, slightly triangular.

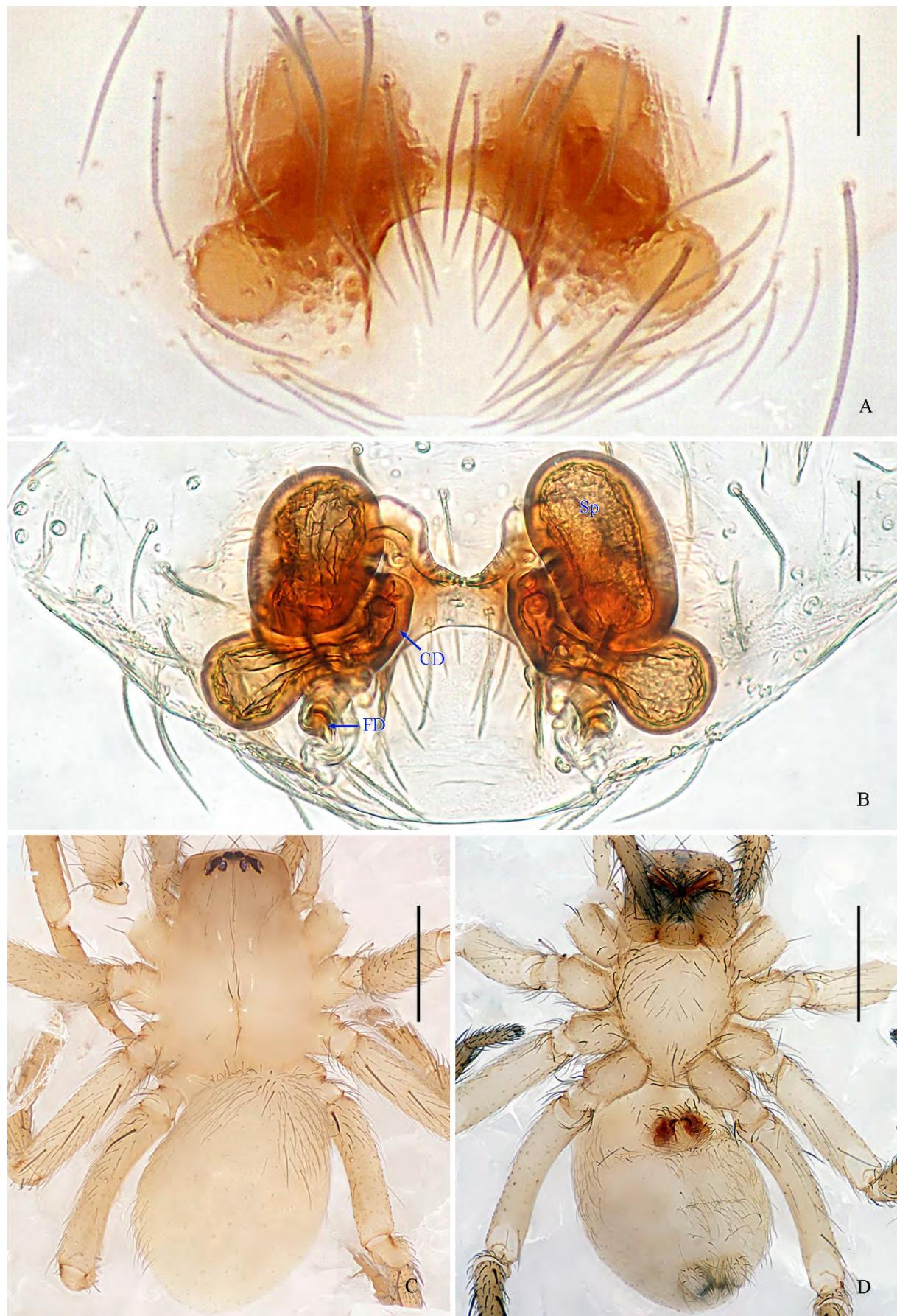


Figure 68. *Cicurina damaoensis* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.05 mm; C–D=0.5 mm.

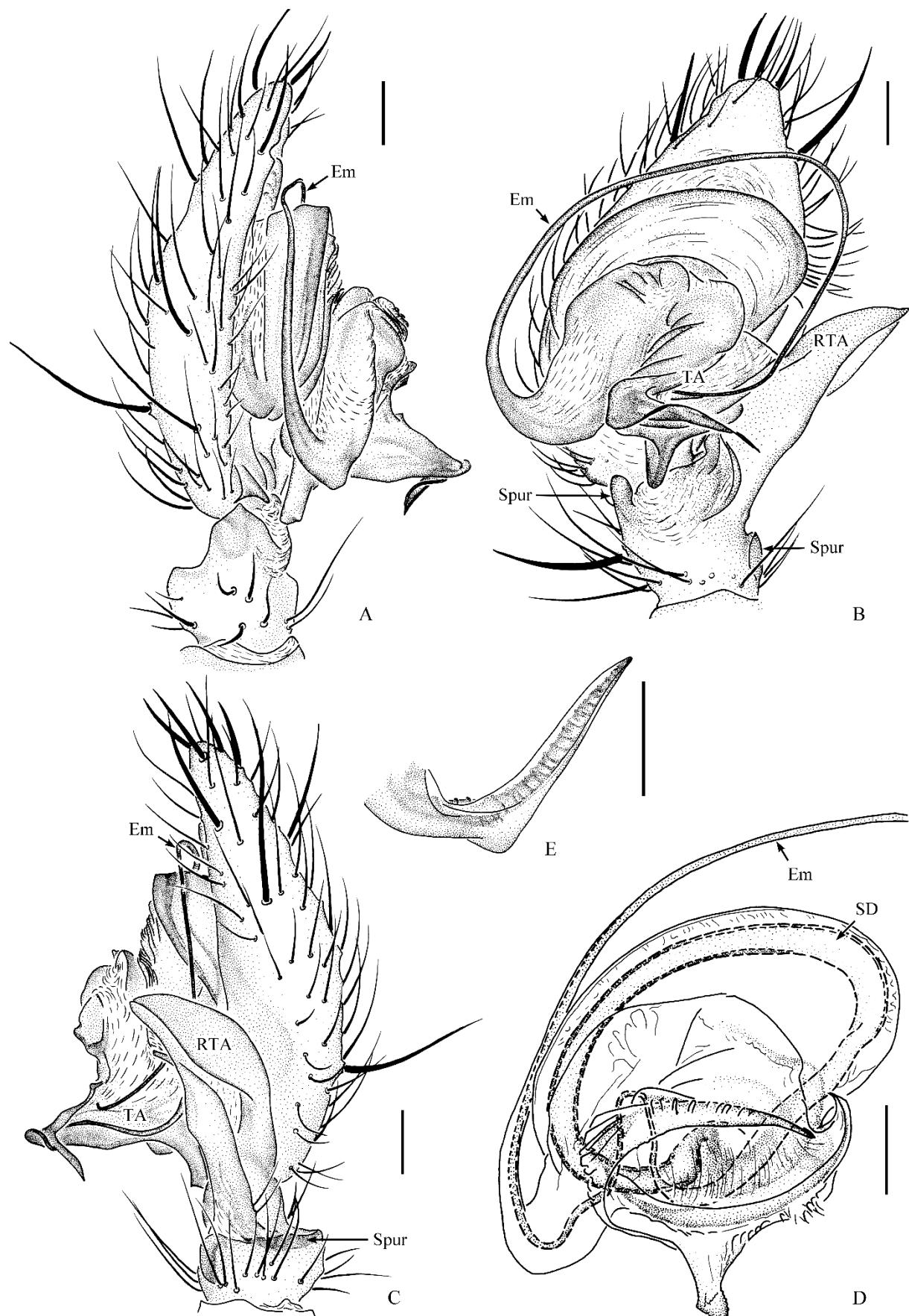


Figure 69. *Cicurina dong Li*, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, retrolateral view. D. Palp bulb, ventral view. E. Terminate of TA, ventral view. Scale bars=0.1 mm.

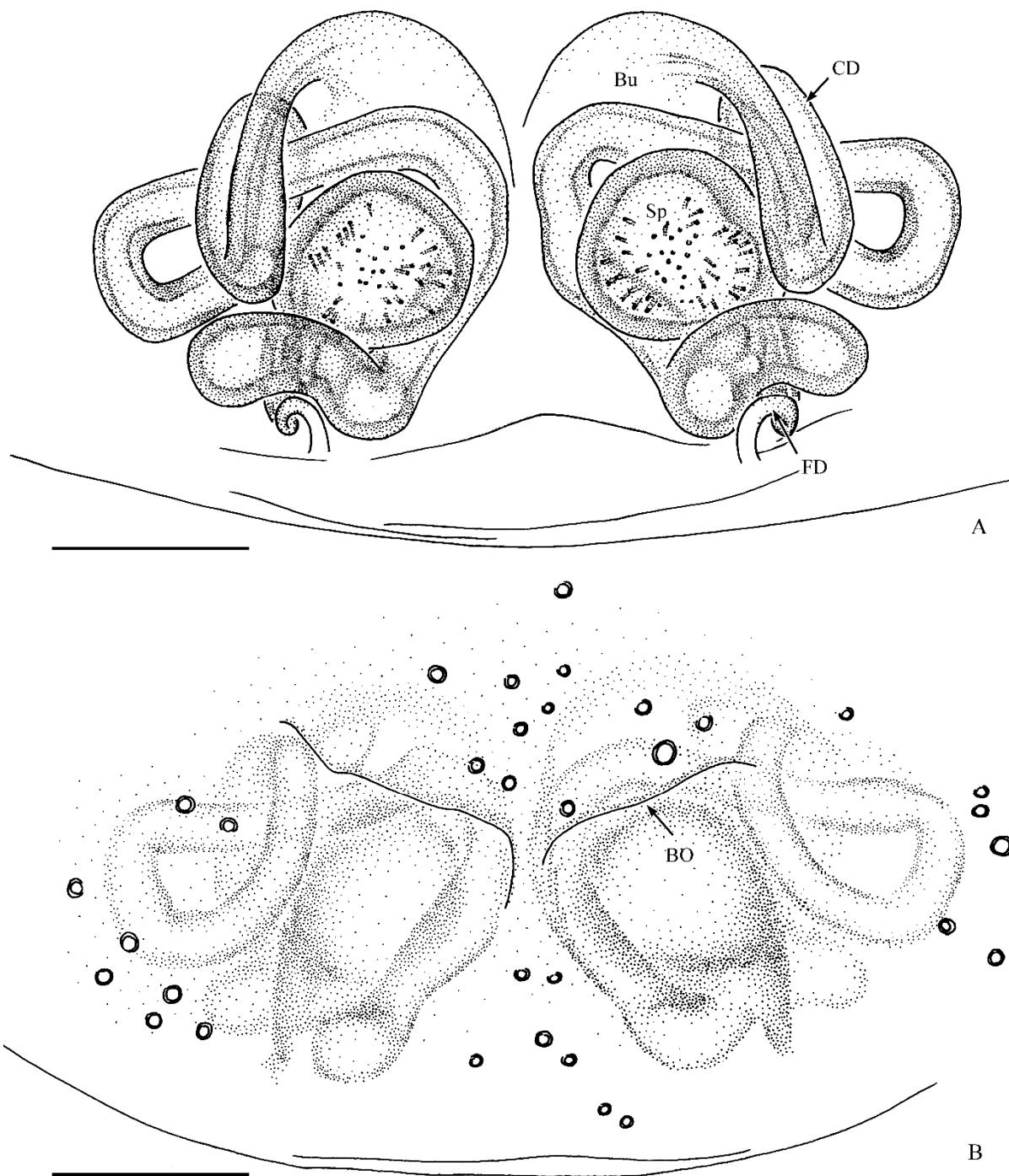


Figure 70. *Cicurina dong* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.1 mm.

Female (one of the paratypes). Total body length 2.96 (Figs 72C–D). Prosoma length 1.32, width 0.94. Cephalic region width 0.76. PER relatively straight. Eye diameters: AME 0.04, ALE 0.10, PLE 0.09, PME 0.08. Eye region length 0.20, width 0.45. Eye interdistances: AME-AME 0.01, AME-ALE 0.04, ALE-PLE 0.03, PLE-PME 0.05, PME-PME 0.10, AME-PME 0.05. Clypeus height 0.13. Chelicerae length 0.58, width 0.34. Chelicerae with distinct lateral condyles, 3 promarginal and 7 retromarginal teeth. Labium length 0.18, width 0.20. Gnathocoxae length 0.44, width 0.28. Sternum length 0.90, width 0.75. Leg formula IV-I-II-III. Leg measurements: I 4.12 (1.24, 0.52, 1.00, 0.84, 0.52); II 3.84 (1.16, 0.48, 0.88, 0.84, 0.48); III 3.44 (0.96, 0.44, 0.72, 0.84, 0.48); IV 4.52 (1.32, 0.48, 1.08, 1.08, 0.56). Opisthosoma length 1.52, width 1.12. Opisthosoma white, with black anchor-shaped pattern.

Epigynum (Figs 70, 72A–B). Width 0.42. BO wide, anteriorly located. Bursae enlarged, not fused. Copulatory ducts hardly separated at midline. Reaching top of spermathecae apex, copulatory ducts curled as rectangular. End of copulatory.

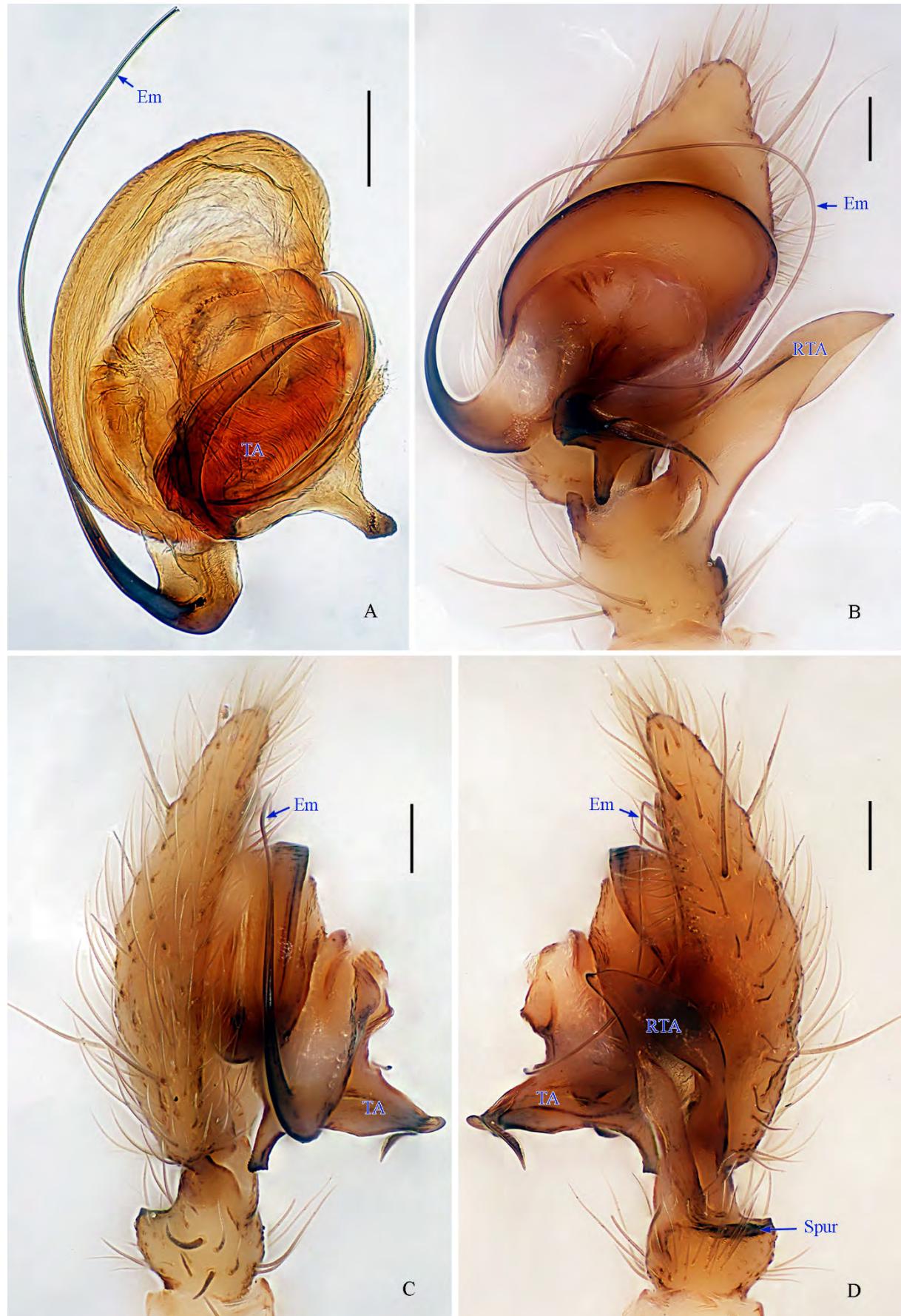


Figure 71. *Cicurina dong* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

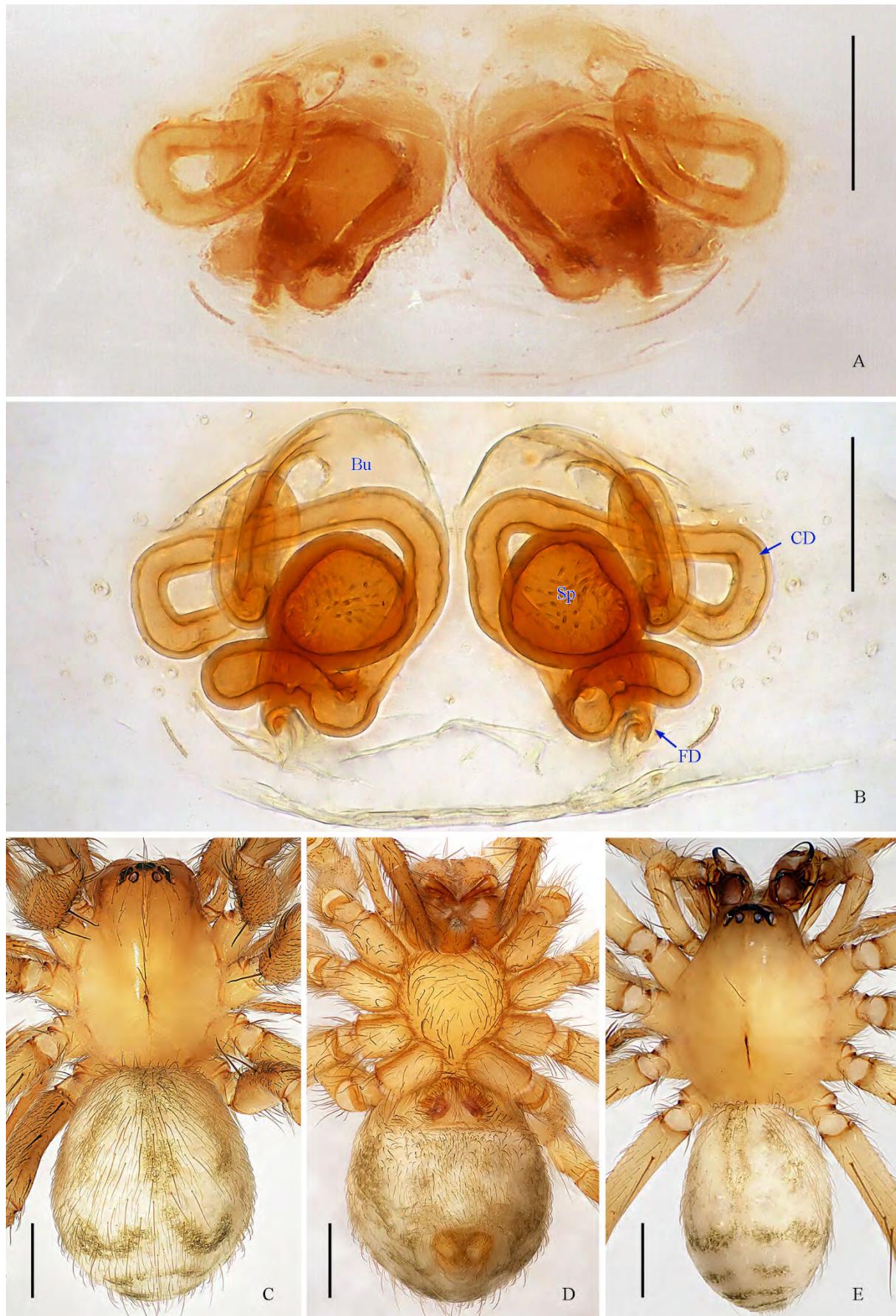


Figure 72. *Cicurina dong* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–E=0.5 mm.

ducts pointing laterally. Spermathecae pear-shaped. Fertilization duct laterally attached at base of spermathecae.

Variation. Total body length: males 2.75–3.15 ( $n=3$ ), females 2.51–3.50 ( $n=30$ ).

Distribution. Known only from the type locality (Fig. 97).

***Cicurina kailiensis* Li, sp. nov. (Figs 73–77, 97)**

Type material. Holotype. Male, China, Guizhou, Kaili City, Jianhe County, Dalao Village, Xie Cave, 26°46.081'N, 108°27.481'E, elev. 924 m, 10 December 2011, Z. Zha & Z. Chen leg., deposited in IZCAS. Paratype. 1 female, same data



Figure 73. *Cicurina kailiensis* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar=0.1 mm.

as holotype, deposited in IZCAS.

**Etymology.** The specific name refers to the type locality; adjective.

**Diagnosis.** Males of this new species are similar to *C. anhuiensis* (Song, Zhu & Chen, 1999: 372, figs 214E–F), but can be distinguished from *C. anhuiensis* by the smooth curved TA prolaterally (twisted and recurved in *C. anhuiensis*), and the laterally extending end of copulatory ducts (joining the spermathecae and not extending laterally in *C. anhuiensis*). Females of this new species can be distinguished from *C. zhazuweii* Li, sp. nov. (Figs 88–89) by the wide atrium (atrium as wide as long in *C. zhazuweii* Li, sp. nov.), the bursae just reaching the base of spermathecae (reaching apex of spermathecae in *C. zhazuweii* Li, sp. nov.), and the laterally extending part of copulatory ducts pointing latero-posteriorly (pointing interior-

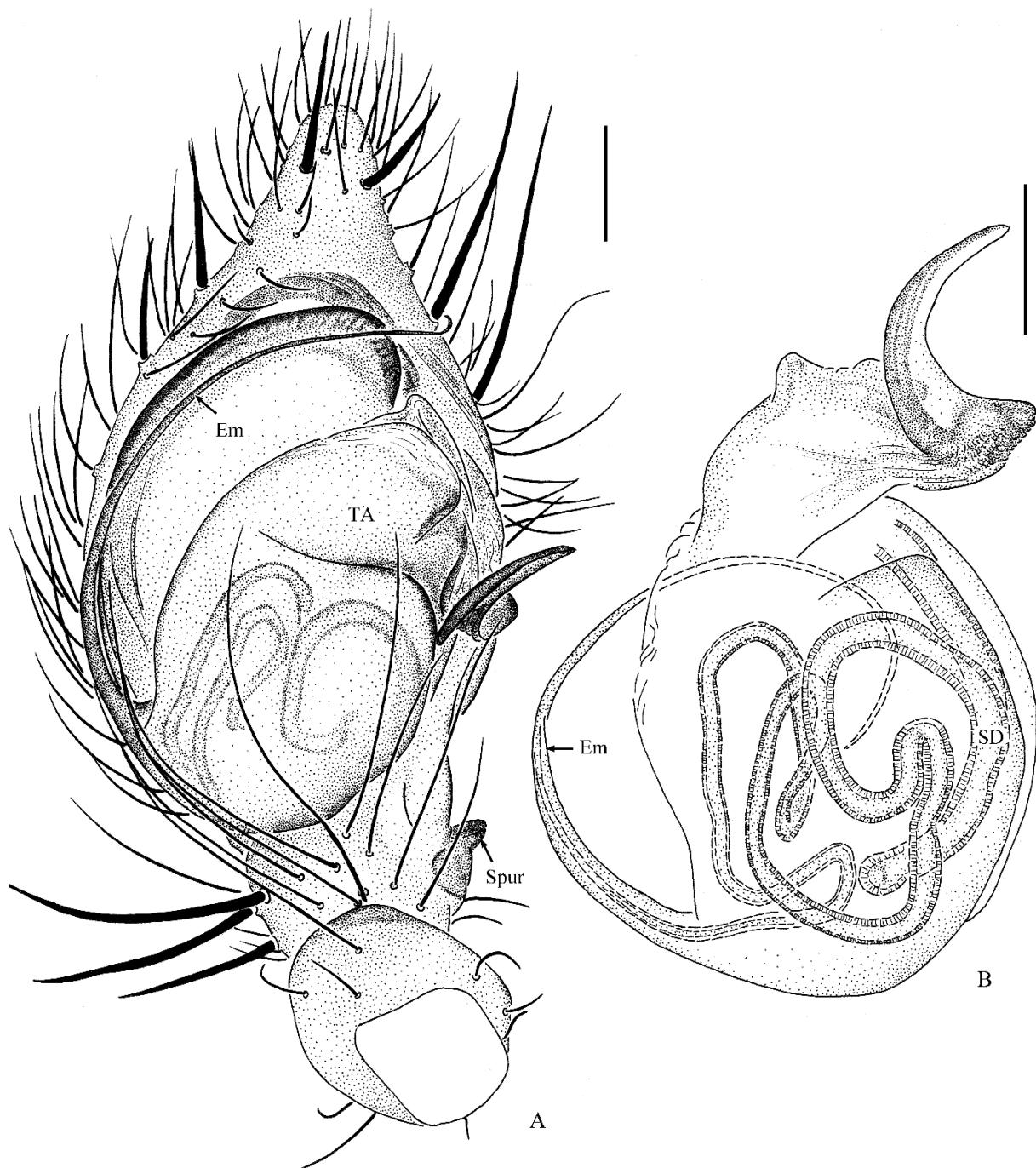


Figure 74. *Cicurina kailiensis* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

posteriorly in *C. zhazuweii* Li, sp. nov.).

Description. Male (holotype). Total length 2.90 (Fig. 77E). Prosoma length 1.40, width 1.13. Cephalic region width 0.50. Prosoma pyriform. Dorsal shield of prosoma yellow, with relatively flat cephalic area. Fovea reduced. Cervical groove indistinct. Eight eyes, AME black, others white. Borders of eyes, particularly AME, encircled with black. PER slightly procurved by half PME diameter. Eye diameters: AME 0.06, ALE 0.08, PLE 0.09, PME 0.08. Eye interdistances: ALE-PLE 0.01, AME-ALE 0.01, AME-AME 0.02, PLE-PME 0.03, PME-PME 0.08. Eye region length 0.16, width 0.36. Clypeus height 0.08. Chelicerae light brown, length 1.10, width 0.50, with distinct lateral condyles, 3 (1 large, 2 small) promarginal and 6 retromarginal teeth. Labium light brown, length 0.19, width 0.24. Gnathocoxae light brown, length 0.33, width 0.25. Sternum yellow, length 0.80, width 0.75. Legs yellow. Leg formula IV-I-II-III. Leg measurements: I 4.15 (1.20, 0.45, 1.00, 0.85, 0.65); II 3.96 (1.13, 0.48, 0.90, 0.85, 0.60); III 3.71 (1.05, 0.43, 0.75, 0.85, 0.63); IV 4.51 (1.25, 0.40, 1.10, 1.13, 0.63). Opisthosoma length 1.50, width 1.20. Opisthosoma yellow, with two rows of gray, large spots. No cibellum and no calamistrum.

Pedipalpus (Figs 73–74, 76). Cymbium length 0.61. Apex of cymbium as long as wide. Embolus originating at approximately 9-o'clock position. Sperm duct in tegulum slender and coiled. TA prolaterally recurving towards base of TA, long, slim, slightly coiled and pointed. RTA apical end pointed, simple, with a single fold and with 2 setae. Spur ear-shaped.

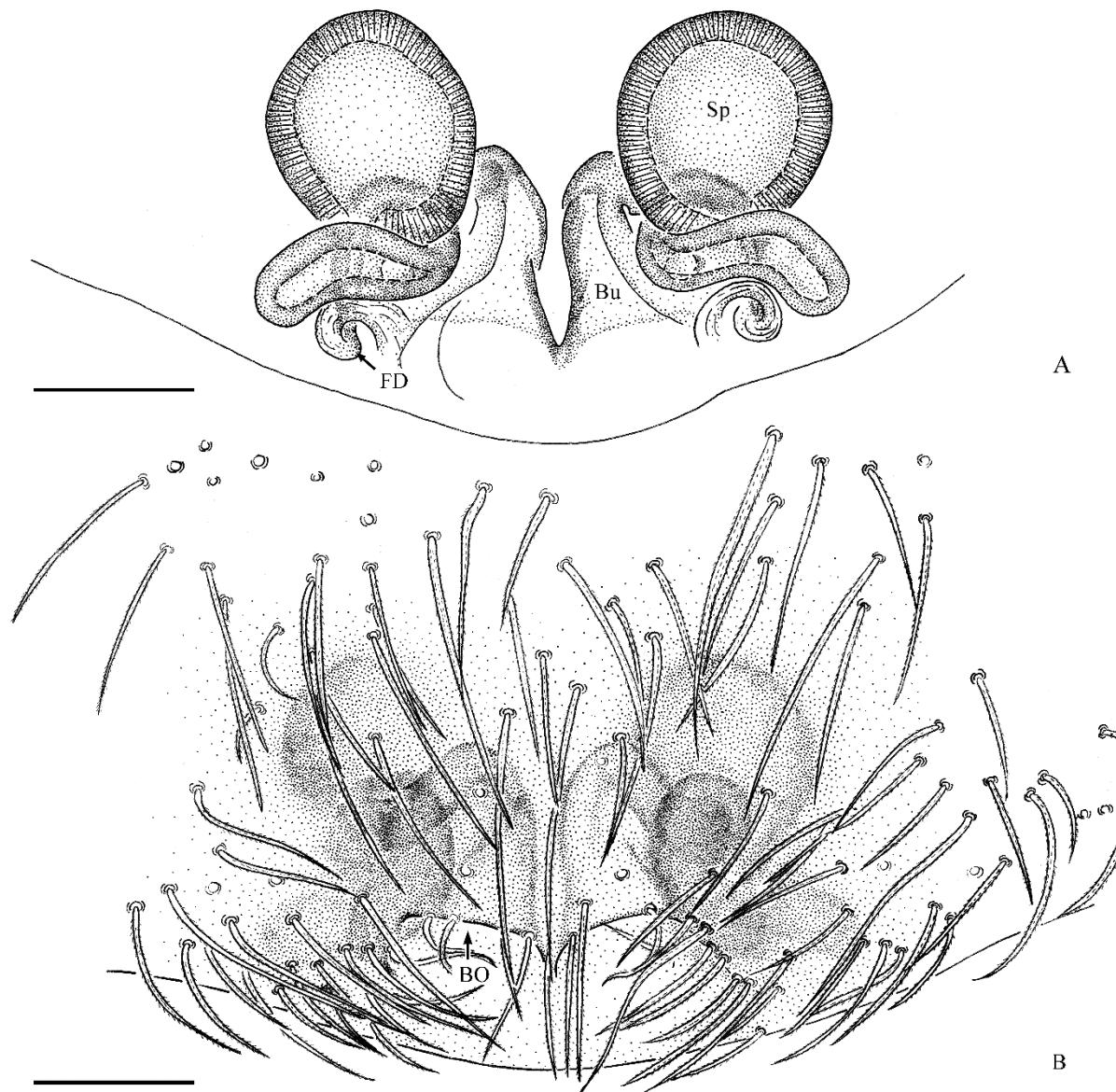


Figure 75. *Cicurina kailiensis* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.1 mm.

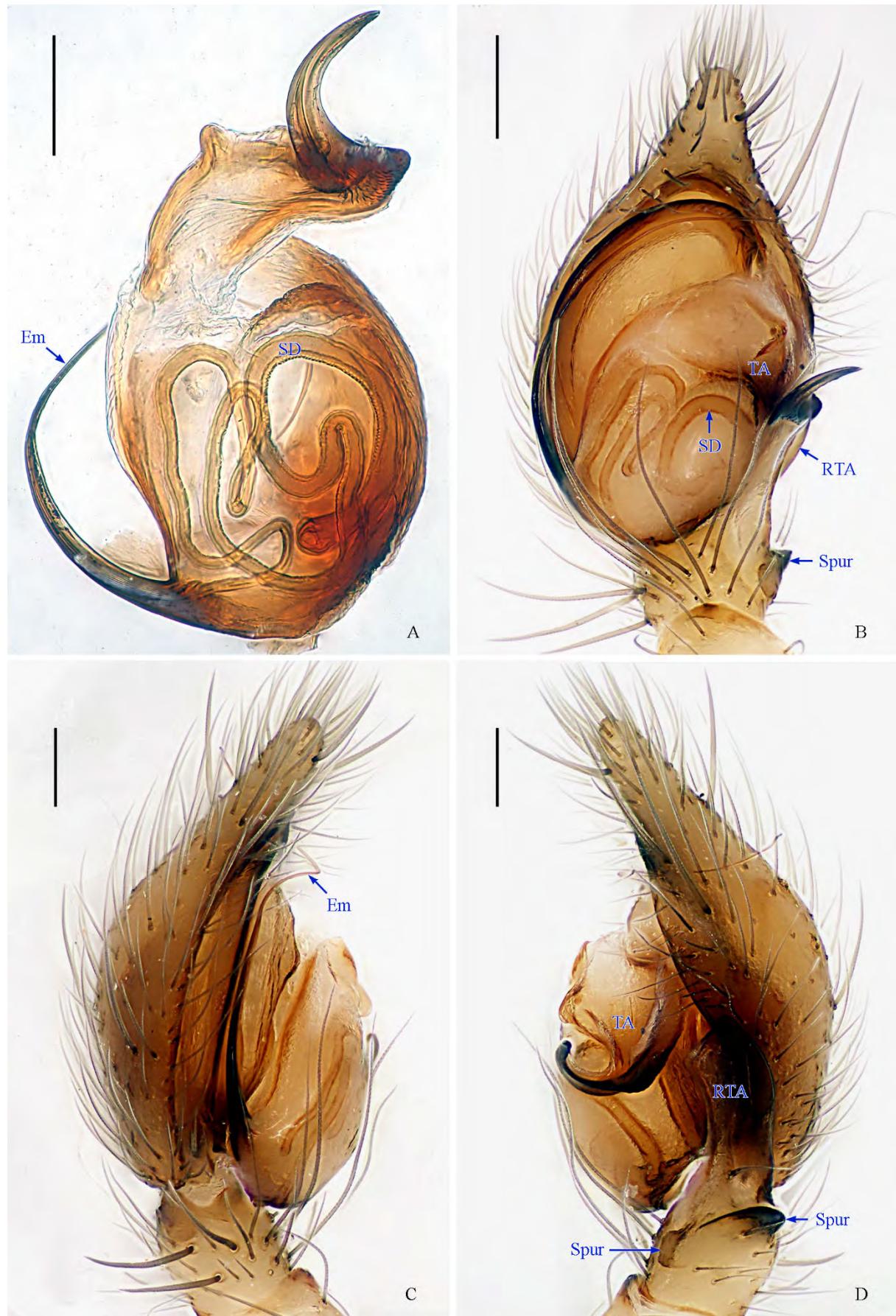


Figure 76. *Cicurina kailiensis* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

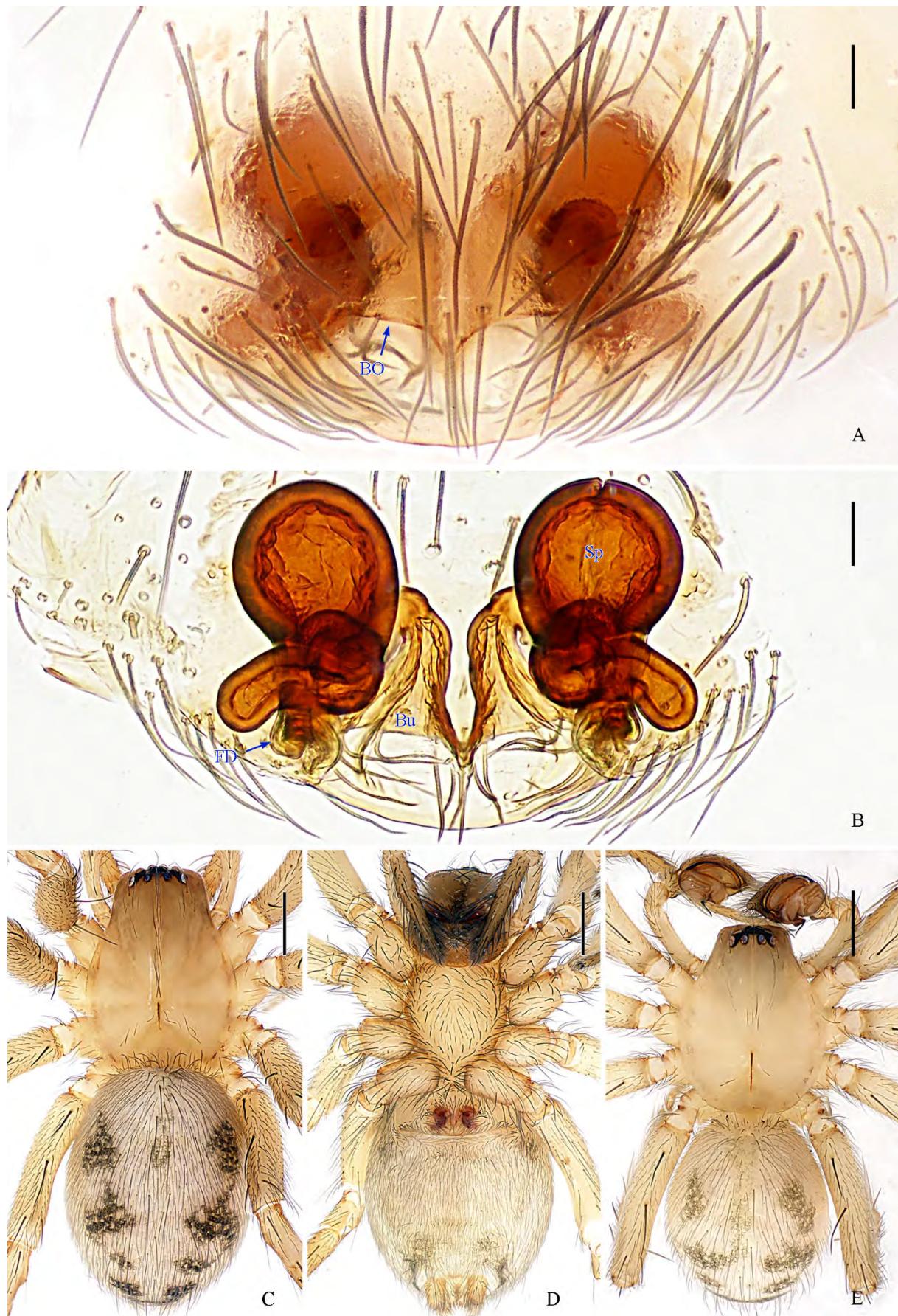


Figure 77. *Cicurina kailiensis* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B = 0.05 mm; C–E = 0.5 mm.

Female (paratype). Total length 3.50 (Figs 77C–D). Prosoma length 1.65, width 1.25. Cephalic region width 0.70. Cephalic part flat. PER slightly procurved by one PME diameter. Eye diameters: AME 0.06, ALE 0.08, PLE 0.10, PME 0.07. Eye interdistances: ALE-PLE 0.01, AME-ALE 0.01, AME-AME 0.02, PLE-PME 0.03, PME-PME 0.08. Eye region length 0.17, width 0.46. Clypeus height 0.15. Chelicerae length 0.68, width 0.34. Chelicerae with distinct lateral condyles, 3 promarginal and 8 retromarginal teeth. Labium length 0.11, width 0.30. Gnathocoxae length 0.36, width 0.30. Sternum length 0.90, width 0.80. Leg formula IV-I-II-III. Leg measurements: I 4.78 (1.35, 0.55, 1.20, 1.00, 0.68); II 4.48 (1.25, 0.50, 1.08, 1.00, 0.65); III 4.24 (1.20, 0.50, 0.93, 0.98, 0.63); IV 5.53 (1.50, 0.55, 1.33, 1.40, 0.75). Opisthosoma length 1.90, width 1.50. Opisthosoma white. Dorsal with two rows of black, big spots.

Epigynum (Figs 75, 77A–B). Width 0.38. Epigynum with large atrium, wide, median with several setae. Bursae enlarged, not fused. Fertilization duct medially attached to the spermathecae base.

Distribution. Known only from the type locality (Fig. 97).



Figure 78. *Cicurina majiangensis* Li, sp. nov., holotype, male. A. Right pedipalpus, retrolateral view. B. Right pedipalpus, prolateral view. Scale bar=0.1 mm.

*Cicurina majiangensis* Li, sp. nov. (Figs 78–80, 97)

Type material. Holotype. Male, China, Guizhou, Kaili City, Majiang County, Xinshan Town, Gubin Village, cave without name, 26°30.047'N, 107°31.151'E, elev. 1065 m, 29 November 2011, H. Chen & Z. Zha leg., deposited in IZCAS.

Etymology. The specific name refers the type locality; adjective.

Diagnosis. This new species is similar to *C. wusanani* Li, sp. nov. (Figs 83–84, 86), but can be distinguished by details of the TA.

Description. Male (holotype). Total length 2.10. Prosoma length 1.10, width 0.92. Cephalic region width 0.50. Prosoma pyriform, cephalic part flat, covered with several setae. Thoracic part yellow, fovea reduced, prosoma margin indistinct. Eight eyes, AME black, others white, all eyes encircled with black. Eye diameters: AME 0.04, ALE 0.08, PLE 0.08, PME 0.06. Eye interdistances: ALE-PLE 0.01, AME-ALE 0.01, AME-AME 0.02, PLE-PME 0.03, PME-PME 0.05. Eye region length 0.15, width 0.30. Clypeus height 0.10. Chelicerae length 0.46, width 0.21, yellow-brown. Chelicerae with distinct lateral condyles, 3 (1 large, 2 small) promarginal and 5 retromarginal teeth. Chelicerae, labium and gnathocoxae yellow;

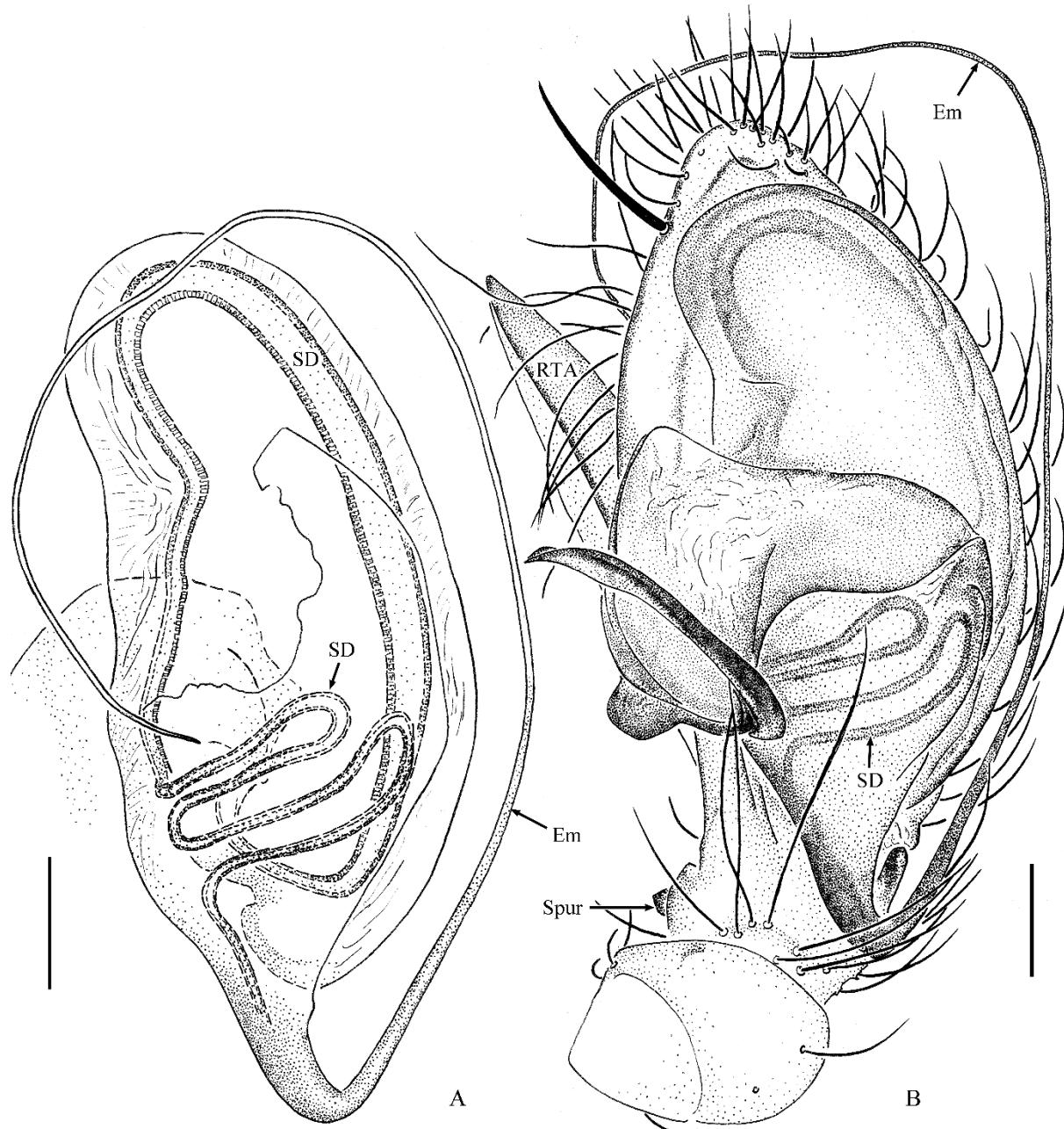


Figure 79. *Cicurina majiangensis* Li, sp. nov., holotype, male. A. Right pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

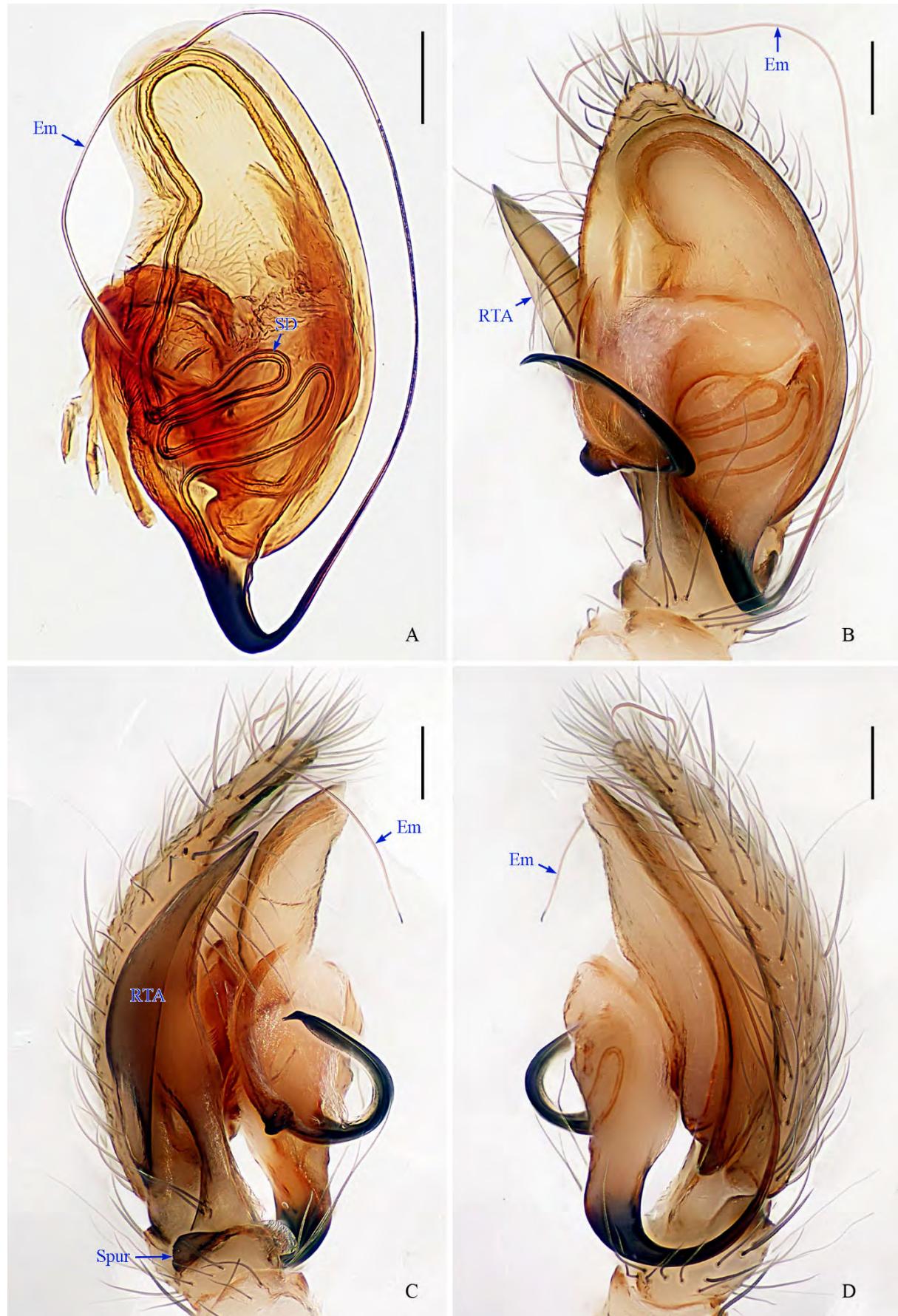


Figure 80. *Cicurina majiangensis* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Right pedipalpus, ventral view. C. Right pedipalpus, retrolateral view. D. Right pedipalpus, prolateral view. Scale bars = 0.1 mm.

sternum white. Labium length 0.13, width 0.18. Gnathocoxae length, width 0.23. Sternum length 0.65, width 0.60. Legs yellow. Leg formula IV-I-II-III. Leg measurements: I 3.45 (1.00, 0.35, 0.85, 0.75, 0.50); II 3.20 (0.95, 0.35, 0.75, 0.65, 0.50); III 2.73 (0.78, 0.30, 0.55, 0.65, 0.45); IV 3.63 (1.00, 0.35, 0.85, 0.88, 0.55). Opisthosoma length 0.98, width 0.85. Opisthosoma pale, without distinct pattern. No cribellum.

Pedipalpus (Figs 78–80). Cymbium length 0.63. Apex of cymbium wide. Embolus originating at approximately 6-o'clock position. Sperm duct in tegulum shaped like a short hair pin or paper clip. Apex of subtegulum with a deep notch. TA prolaterally recurving towards base of a long and slim TA. TA with a small and rough lateral apophysis. RTA apical end pointed, simple, with a single fold and 2 setae. Spur ear-shaped.

Female. Unknown.

Distribution. Known only from the type locality (Fig. 97).

*Cicurina parallela* Li, sp. nov. (Figs 81–82, 97)

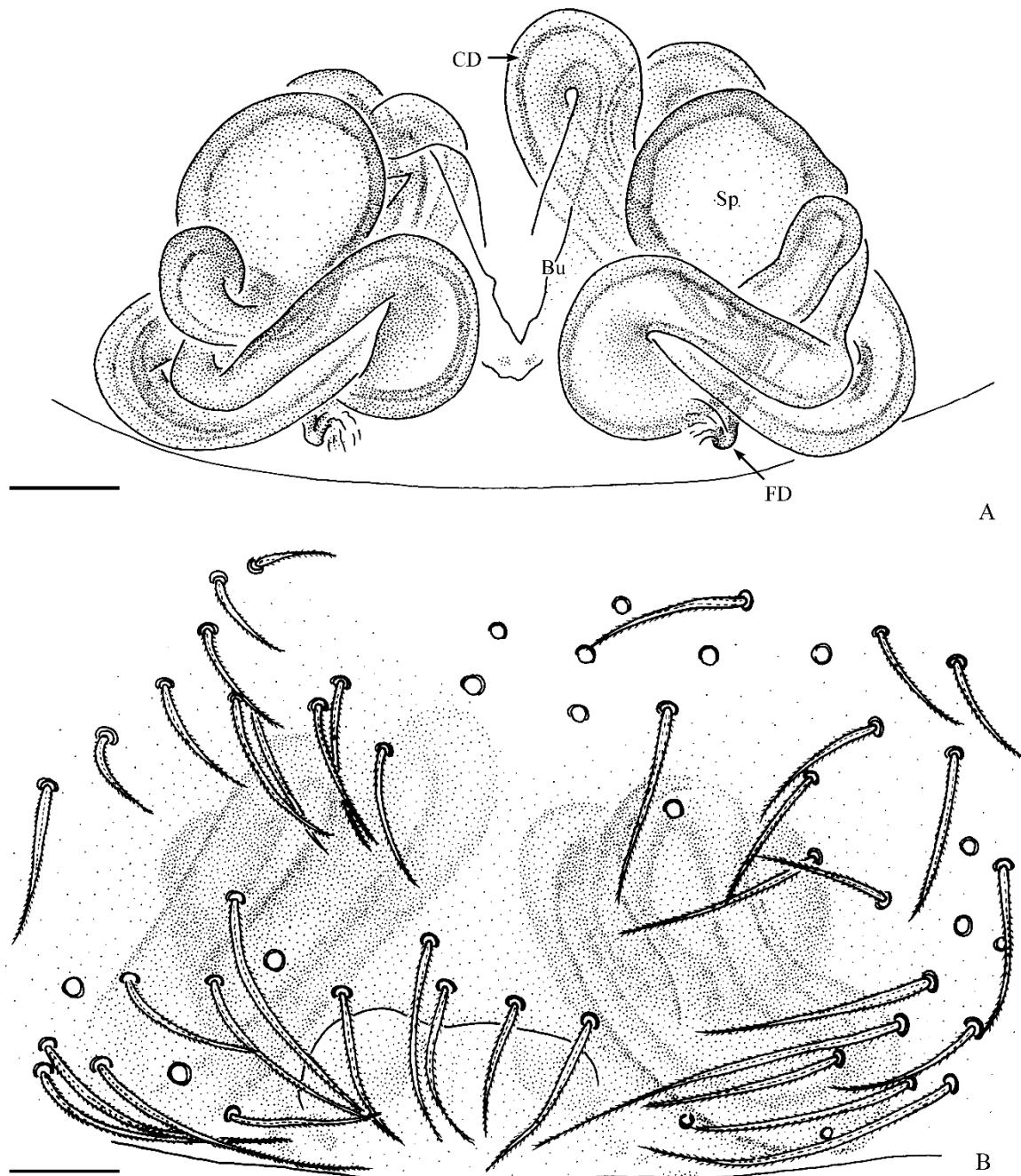


Figure 81. *Cicurina parallela* Li, sp. nov., holotype female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.05 mm.



Figure 82. *Cicurina parallela* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–D=0.5 mm.

Type material. Holotype. Female, China, Guizhou, Guiyang City, Nanming District, Mutou Village, Jianlong Cave, 26°32.766'N, 106°46.892'E, elev. 1103 m, 19 April 2007, Y. Lin & J. Liu leg., deposited in IZCAS.

**Etymology.** The specific name is derived from the Latin word “*parallelus*”, meaning “parallel”, and refers to the ventral view of the female copulatory ducts; adjective.

**Diagnosis.** Females of this species are most similar to *C. dong* Li, sp. nov. (Figs 70, 72A–B), but can be distinguished by the posteriorly located atrium (anteriorly situated in *C. dong* Li, sp. nov.), and the end of copulatory ducts not extending laterally (extending laterally in *C. dong* Li, sp. nov.).

**Description.** Female (holotype). Total body length 2.25 (Figs 82C–D). Prosoma length 1.05, width 0.90. Cephalic region width 0.55. Cephalic part relatively flat, brown, covered with several setae. Thoracic part dark brown, fovea reduced. Eight eyes, AME black, others white. All eyes encircled with black. PER straight. Eye diameters: AME 0.04, ALE 0.07, PLE 0.07, PME 0.07. Eye region length 0.16, width 0.37. Eye interdistances: AME-AME 0.03, AME-ALE 0.03, ALE-PLE 0.02, PLE-PME 0.05, PME-PME 0.07. Clypeus height 0.08. Chelicerae length 0.43, width 0.28. Chelicerae with distinct lateral condyles, 3 promarginal and 8 retromarginal teeth. Labium length 0.13, width 0.21. Gnathocoxae length 0.31, width 0.20. Sternum length 0.69, width 0.63. Legs brown. Leg formula IV-I-II-III. Leg measurements: I 3.41 (1.00, 0.43, 0.85, 0.68, 0.45); II 3.08 (0.90, 0.40, 0.70, 0.65, 0.43); III 2.94 (0.88, 0.40, 0.58, 0.63, 0.45); IV 3.60 (1.00, 0.40, 0.85, 0.85, 0.50).

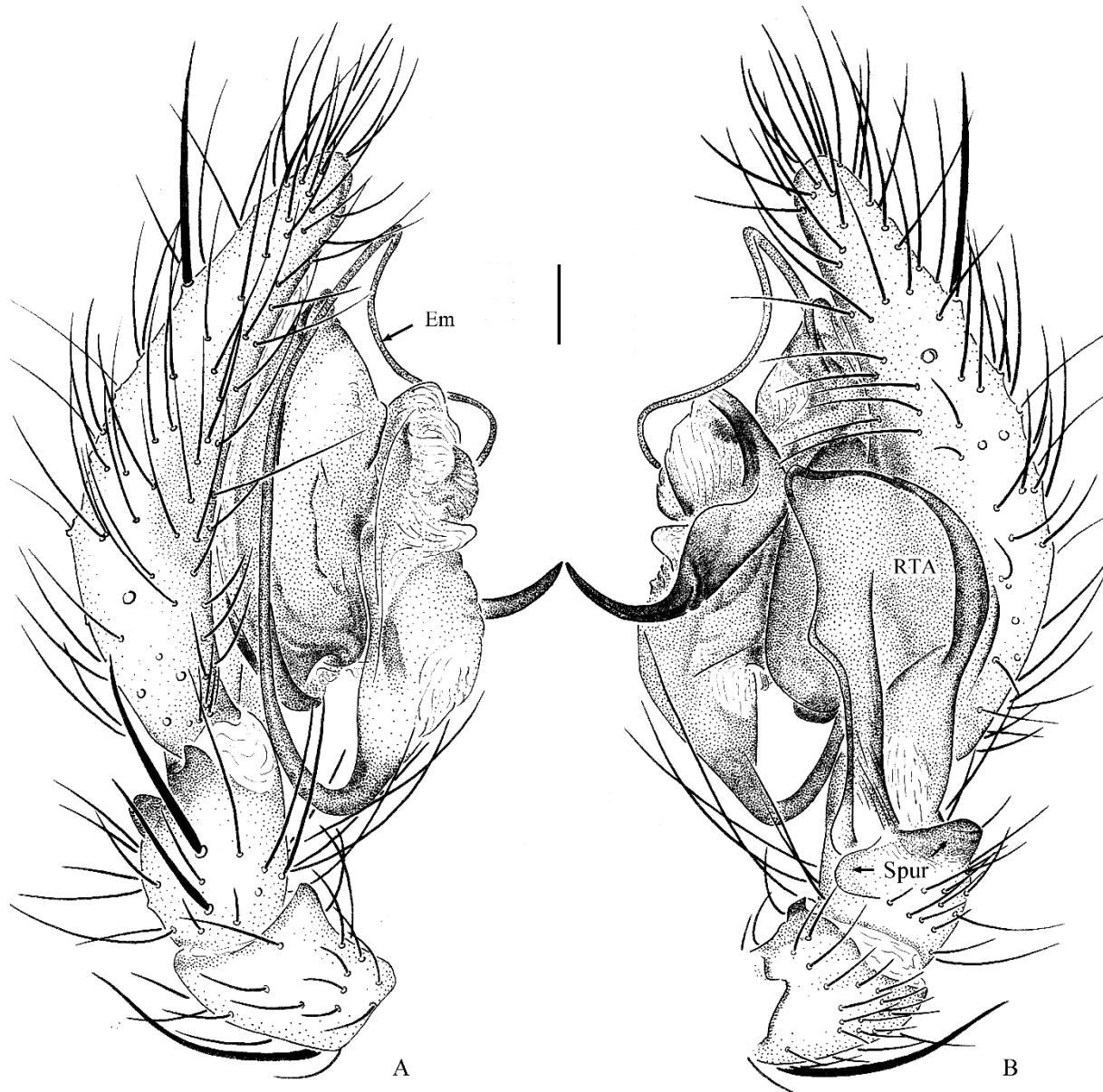


Figure 83. *Cicurina wusanani* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar = 0.1 mm.

Opisthosoma length 1.43, width 1.13. Opisthosoma white, with black anchor shaped pattern. Venter without distinct pattern. Spinnerets yellow-brown. No cribellum and no calamistrum.

Epigynum (Figs 81, 82A–B). Width 0.38. Atrium posteriorly located on epigynal plate. Copulatory ducts inverted “V” in ventral view, parallel. Bursae enlarged, slightly fused at base. Copulatory ducts slender, internally joining base of spermathecae. Spermathecae spherical, widely separated. Fertilization duct long, medially attached at base of spermathecae.

Male. Unknown.

Distribution. Known only from the type locality (Fig. 97).

**Cicurina wusanani Li, sp. nov.** (Figs 83–87, 97)



Figure 84. *Cicurina wusanani* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. Scale bars = 0.1 mm.

Type material. Holotype. Male, China, Guizhou, Kaili City, Leishan County, Datang Town, Zadao Village, Yexiangui Cave, 26°19.068'N, 108°03.939'E, elev. 985 m, 4 December 2011, Z. Zha & Z. Chen leg., deposited in IZCAS. Paratypes. 4 females, same data as holotype, deposited in IZCAS.

**Etymology.** The specific name is a patronym in honor of Prof. San'an Wu from Beijing Forestry University; noun in apposition. Prof. Wu is a leading taxonomist in Coccoidea in China.

**Diagnosis.** Males of this new species are similar to *C. medina* (Paquin & Dupérré, 2009: 31, figs 56–57), but can be distinguished by the smooth distal part of tegulum (with deep notch in *C. medina*), RTA without setae (with 5 setae in *C. medina*). Females of this new species are similar to *C. avicularia* Li, sp. nov. (Figs 64, 66A–B), but can be distinguished by the relatively small and undivided BO (large and divided BO in *C. avicularia* Li, sp. nov.), the reniform spermathecae (spherical in *C. avicularia* Li, sp. nov.), and the end of copulatory duct not extending laterally (laterally extending in *C. avicularia* Li, sp. nov.).

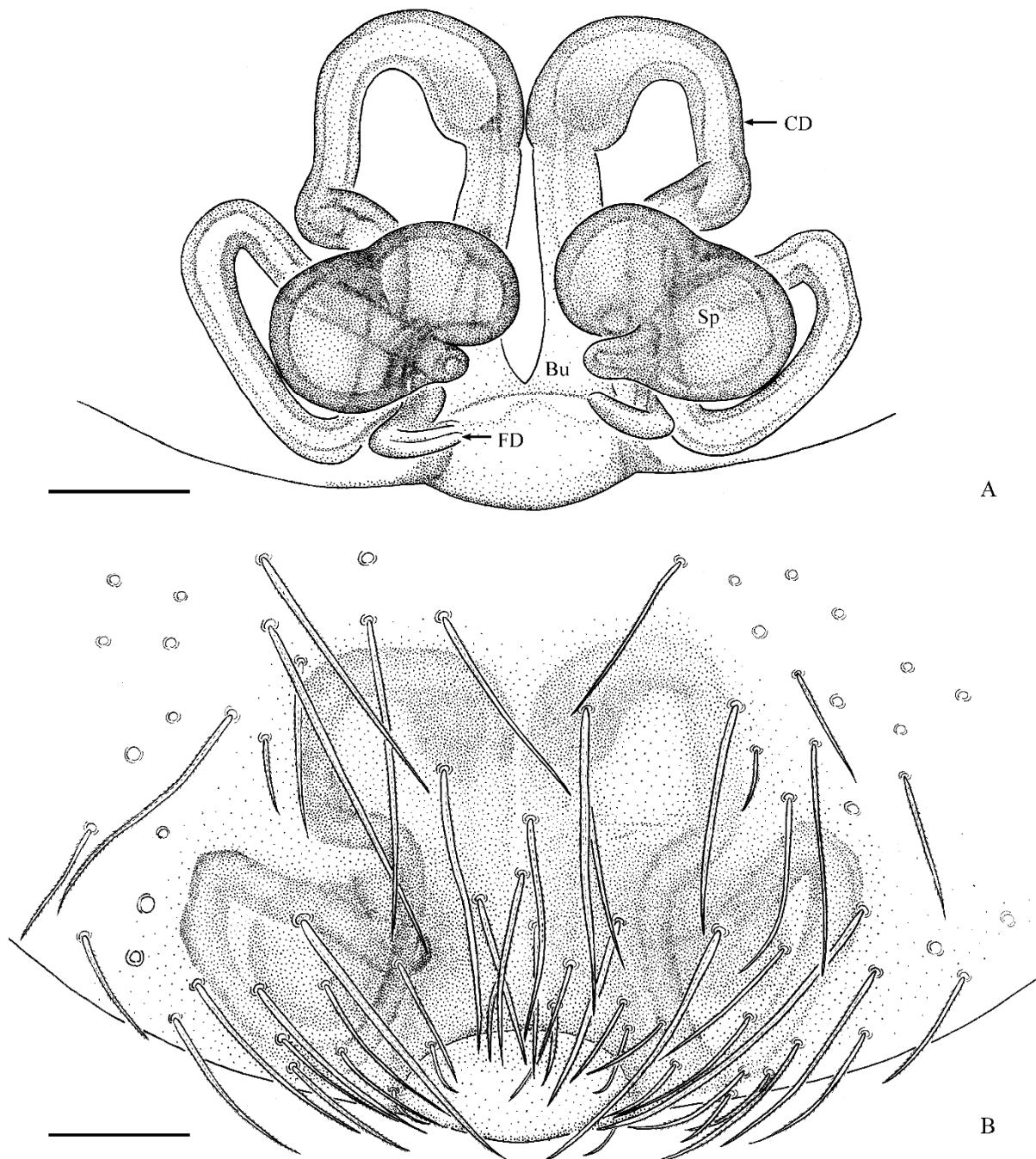


Figure 85. *Cicurina wusanani* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.1 mm.

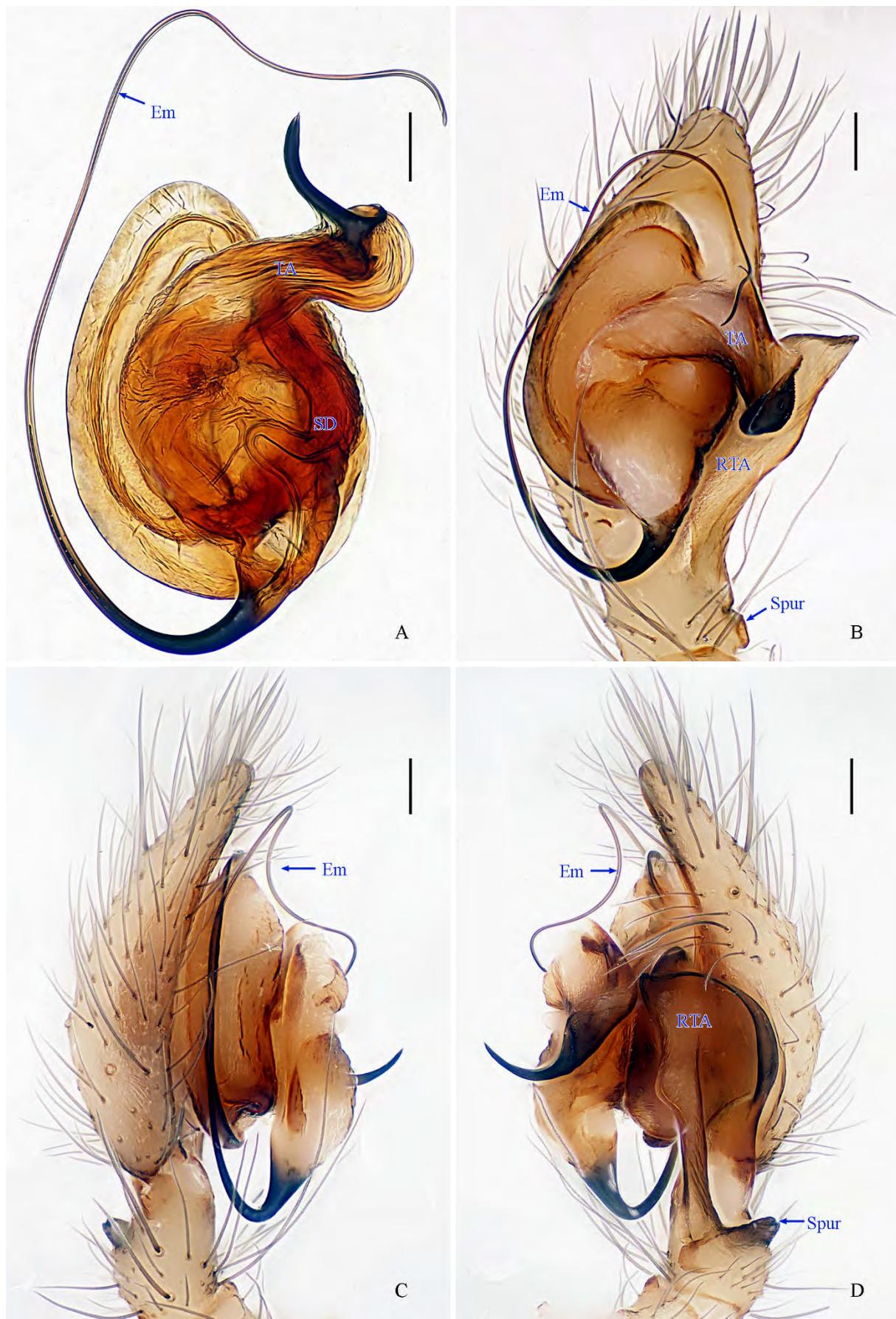


Figure 86. *Cicurina wusanani* Li, sp. nov., holotype male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

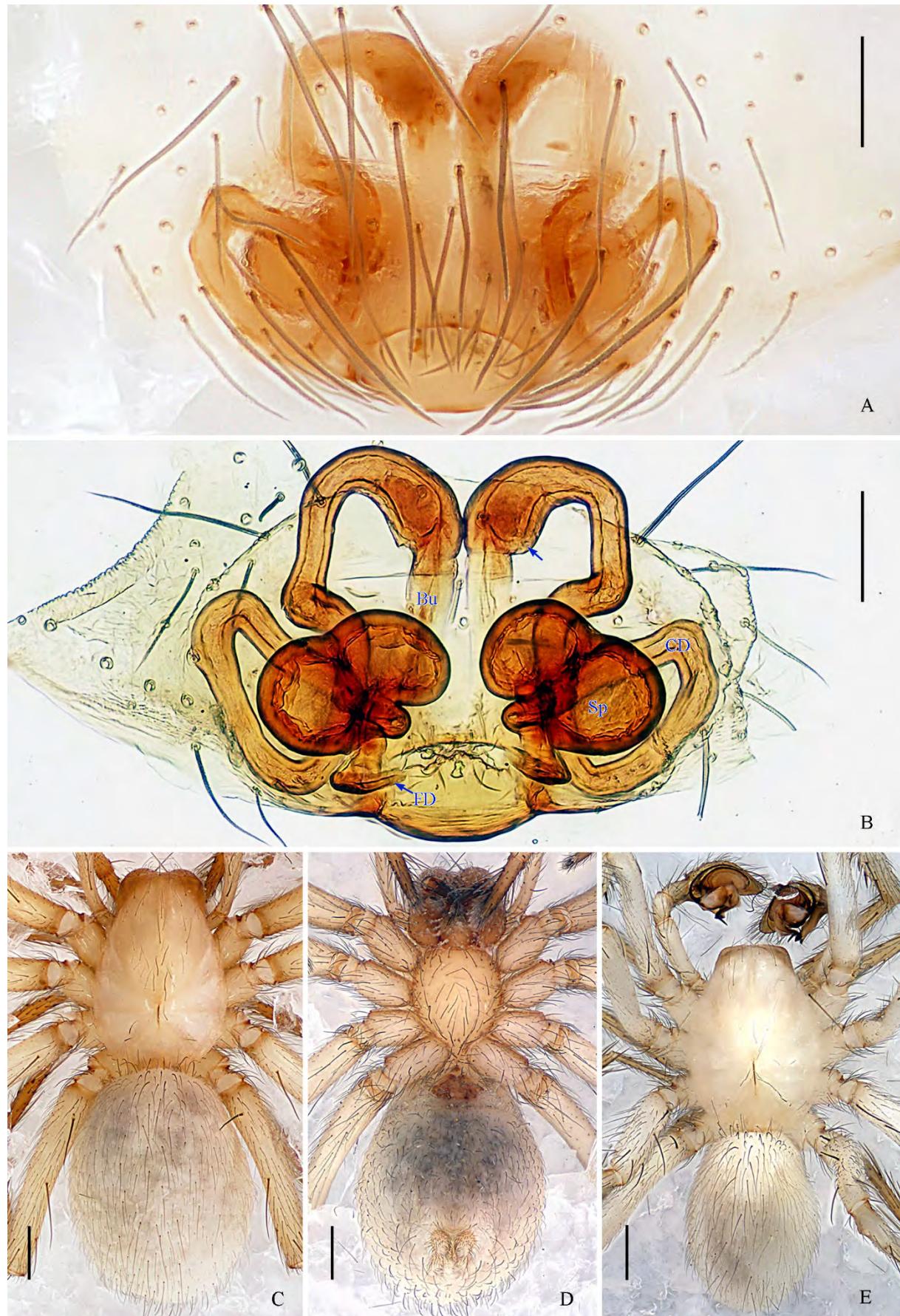


Figure 87. *Cicurina wusanani* Li, sp. nov. A–D. Paratype, female. E. Holotype, male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–E=0.5 mm.

Description. Male (holotype). Total length 3.40 (Fig. 87E). Prosoma length 1.73, width 1.30. Cephalic region width 0.70. Prosoma ovoid, cephalic part flat, covered with several setae. Thoracic part white, fovea reduced, prosoma margin indistinct. No eyes. Chelicerae length 0.69, width 0.31. Chelicerae with distinct lateral condyles, 3 (2 large, 1 small) promarginal and 7 retromarginal teeth. Chelicerae, labium and gnathocoxae yellow-brown; sternum white. Labium length 0.20, width 0.28. Gnathocoxae length 0.45, width 0.30. Sternum length 0.88, width 0.83. Legs white. Leg formula IV-I-II-III. Leg measurements: I 5.46 (1.50, 0.63, 1.25, 1.23, 0.85); II 5.21 (1.40, 0.60, 1.13, 1.23, 0.85); III 4.98 (1.38, 0.55, 1.00, 1.25, 0.80); IV 6.49 (1.65, 0.63, 1.48, 1.73, 1.00). Opisthosoma length 1.75, width 1.30. Opisthosoma pale, without distinct pattern. No cribellum.

Pedipalpus (Figs 83–84, 86). Cymbium length 0.76. Apex of cymbium as wide as long. Embolus originated at approximately 6-o'clock position. Embolus slender, filiform. Sperm duct in tegulum inverse "S"-shaped. Base of TA

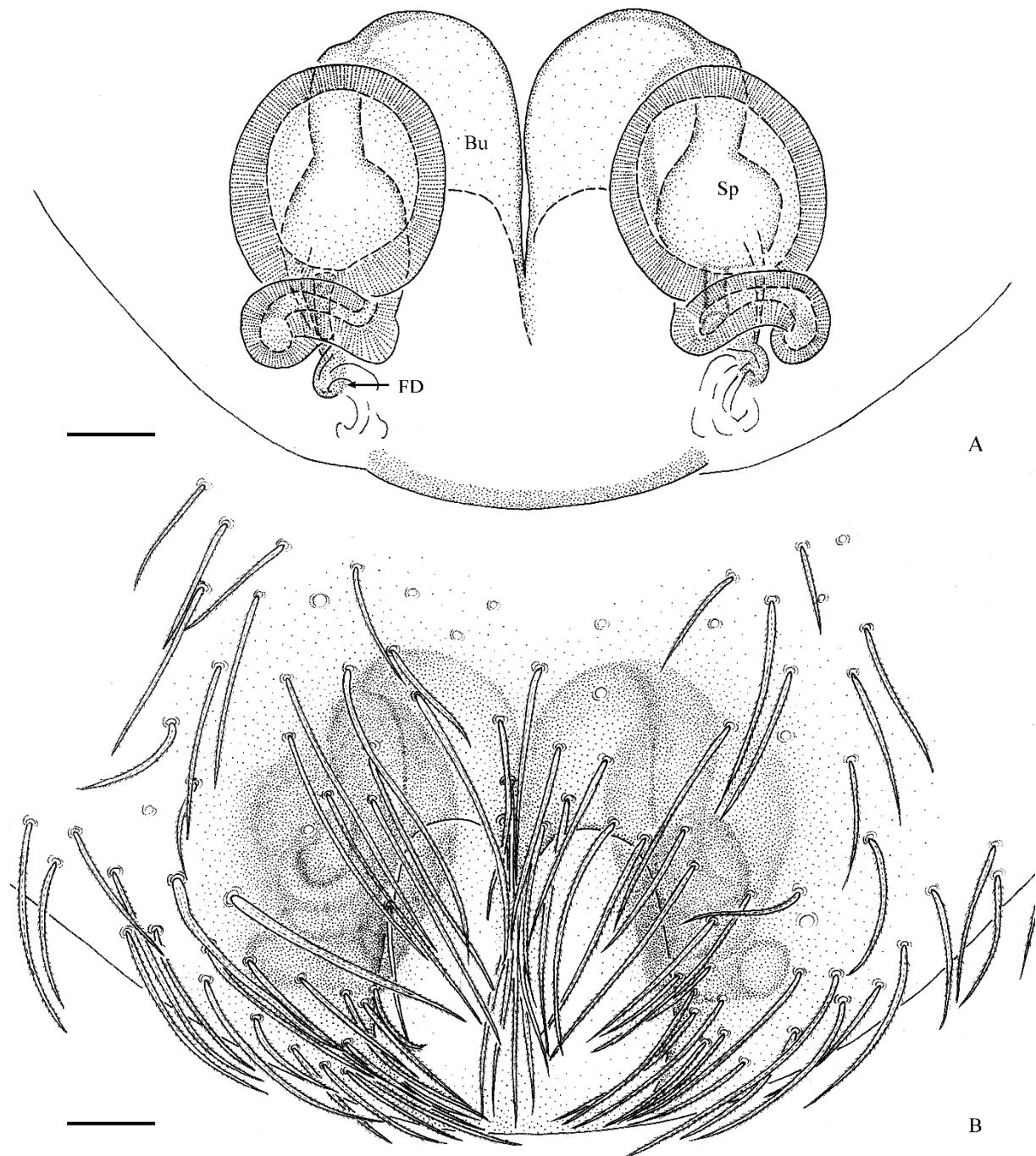


Figure 88. *Cicurina zhazuweii* Li, sp. nov., holotype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars=0.05 mm.



Figure 89. *Cicurina zhazuweii* Li, sp. nov., holotype, female. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–D=0.5 mm.

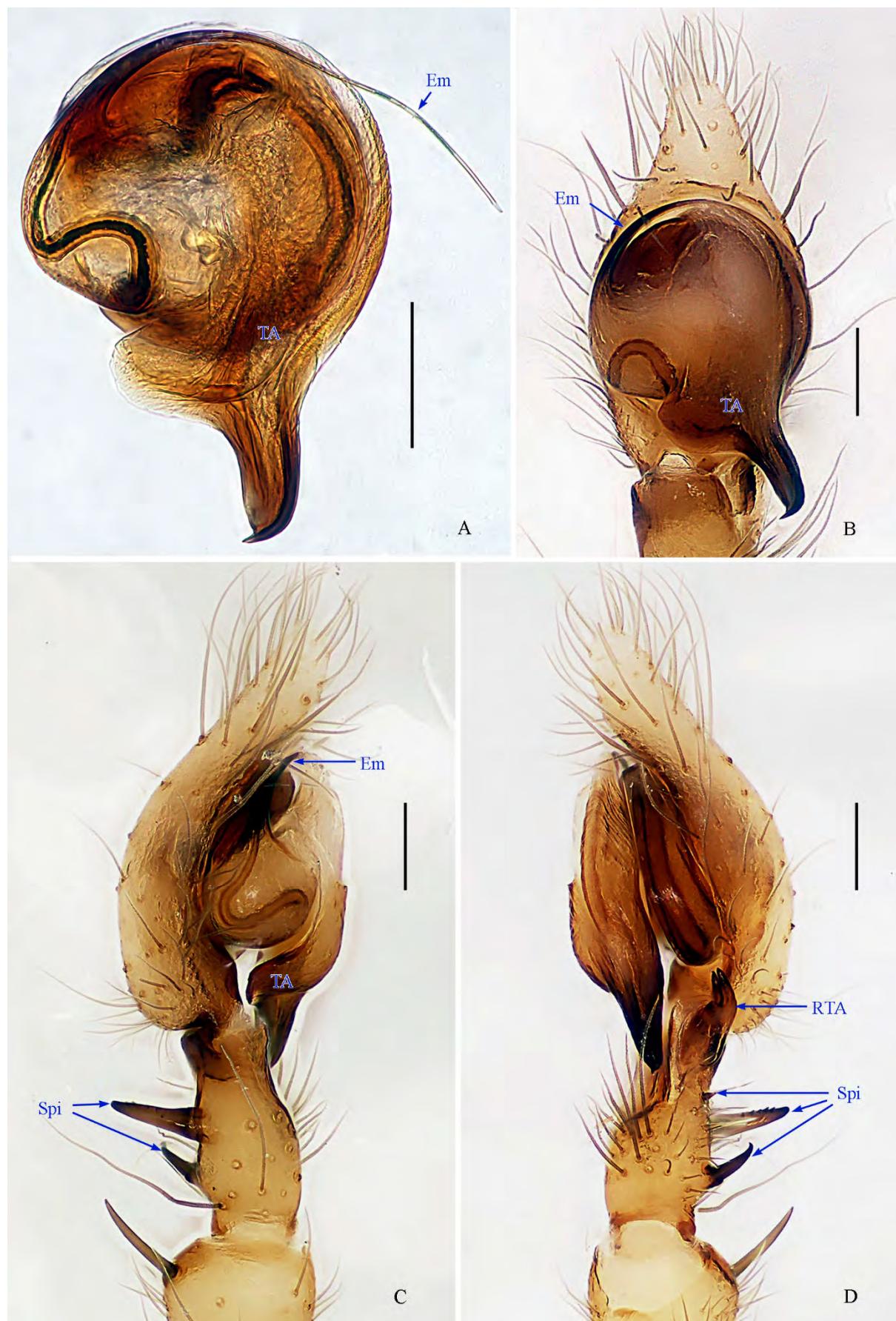


Figure 90. *Lathys chishuiensis* Zhang, Yang & Zhang, 2009, paratype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars = 0.1 mm.

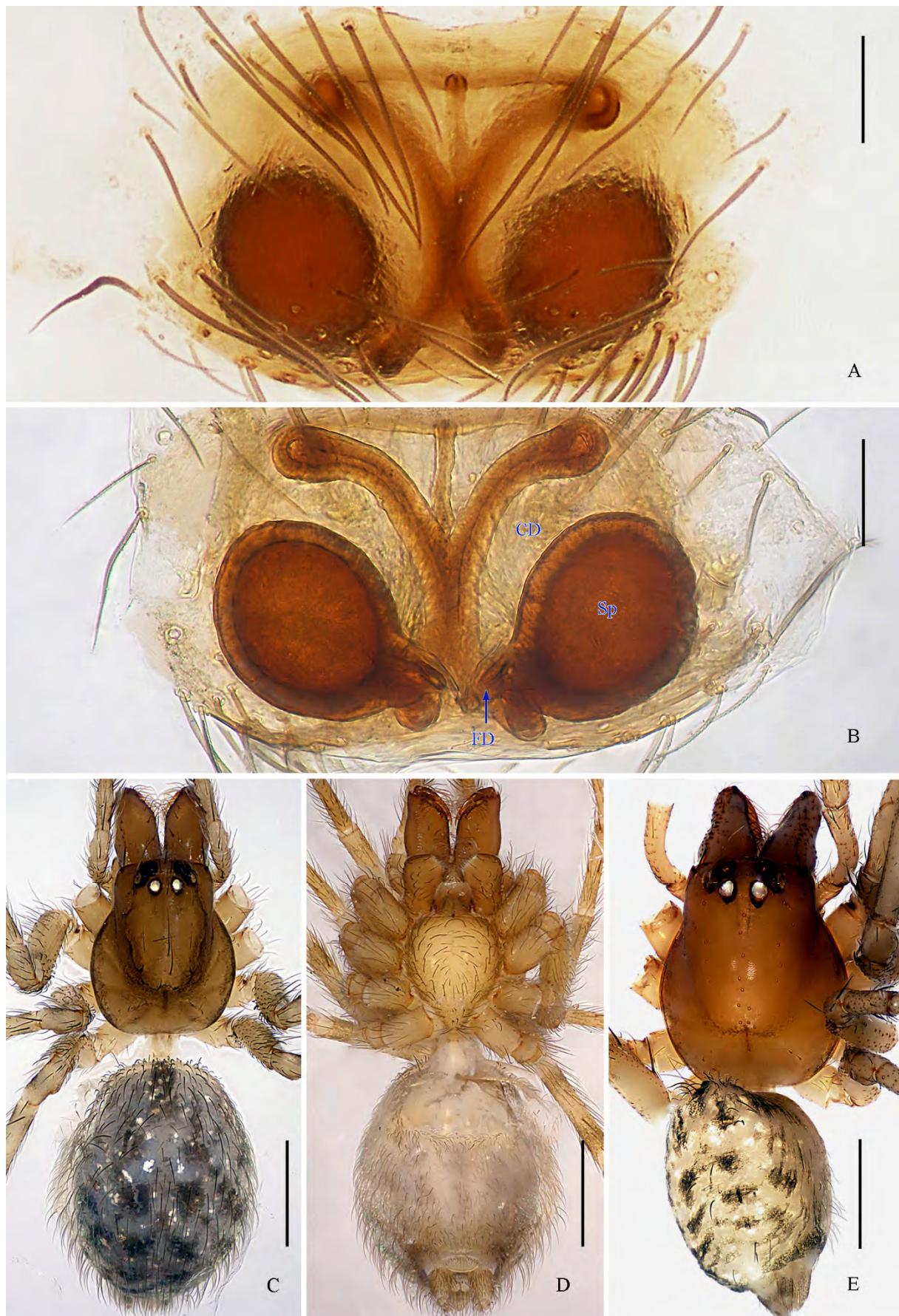


Figure 91. *Lathys chishuiensis* Zhang, Yang & Zhang, 2009, paratype. A–D. Female. E. Male, habitus, dorsal view. A. Epigynum, ventral view. B. Vulva, dorsal view. C. Habitus, dorsal view. D. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–E=0.5 mm.

prolaterally with row of notches. RTA apical end pointed, simple, with a single fold and without setae. Spur slightly triangular.

Female (one of the paratypes). Total length 4.10 (Figs 87C–D). Prosoma length 1.90, width 1.33. Cephalic region width 0.75. Thoracic part yellow. No eyes. Chelicerae with distinct lateral condyles, 3 (1 large, 2 small) promarginal and 6 retromarginal teeth. Labium length 0.25, width 0.34. Gnathocoxae length 0.58, width 0.30. Sternum length 1.00, width 0.85. Leg formula I-IV-II-III. Leg measurements: I 6.18 (1.75, 0.70, 1.50, 1.35, 0.88); II 5.72 (1.65, 0.63, 1.33, 1.28, 0.83); III 5.28 (1.50, 0.55, 1.10, 1.38, 0.75); IV 7.16 (1.95, 0.63, 1.70, 1.88, 1.00). Opisthosoma length 2.40, width 1.80, without distinct pattern.

Epigynum (Figs 85, 87A–B). Width 0.47. Epigynum with a small atrium, oval, posteriorly located. Bursae slightly enlarged, not fused. Copulatory duct joining the spermathecae at the inner constriction of spermathecae; spermathecae reniform. Fertilization duct internally attached to the spermathecae base.

Variation. Total length: females 3.80–4.42 ( $n=4$ ).

Distribution. Known only from the type locality (Fig. 97).

*Cicurina zhazuweii* Li, sp. nov. (Figs 88–89, 97)



Figure 92. *Lathys inaffecta* Li, sp. nov., holotype, male. A. Left pedipalpus, prolateral view. B. Left pedipalpus, retrolateral view. Scale bar = 0.1 mm.

Type material. Holotype. Female, China, Guizhou, Bijie City, Jinsha County, Xiluo Town, Xishan Village, Liaoya Cave, 27°31.153'N, 106°14.793'E, elev. 936 m, 29 May 2011, Z. Zha leg., deposited in IZCAS.

**Etymology.** The specific name is a patronym in honor of the late Mr. Zuwei Zha, the collector of the holotype; noun in apposition. Graduated with a M.Sc degree from the Guizhou Normal University in 2011, he worked on the taxonomy of the spider families of Atypidae and Hexathelidae. Mr. Zha passed away in 2013 at the age of 30.

**Diagnosis.** This new species is similar to *C. kailiensis* Li, sp. nov. (Figs 73–77), but can be distinguished by the longer-than-wide atrium (atrium wider than long in *C. kailiensis* Li, sp. nov.), the bursae reaching the apex of spermathecae (just reaching base of spermathecae in *C. kailiensis* Li, sp. nov.), and the laterally extended part of copulatory ducts pointing postero-medially (pointing posterior-laterally in *C. kailiensis* Li, sp. nov.).

**Description.** Female (holotype). Total length 2.51 (Figs 89C–D). Prosoma length 1.18, width 0.90. Cephalic region width 0.57. Cephalic part flat, covered with several setae. Thoracic part light brown, fovea reduced, prosoma margin indistinct. Eight eyes, AME black, others white, all eyes encircled with black. Eye diameters: AME 0.05, ALE 0.07, PLE 0.09, PME 0.07. Eye interdistances: ALE-PLE 0.01, AME-ALE 0.02, AME-AME 0.02, PLE-PME 0.04, PME-PME 0.07.

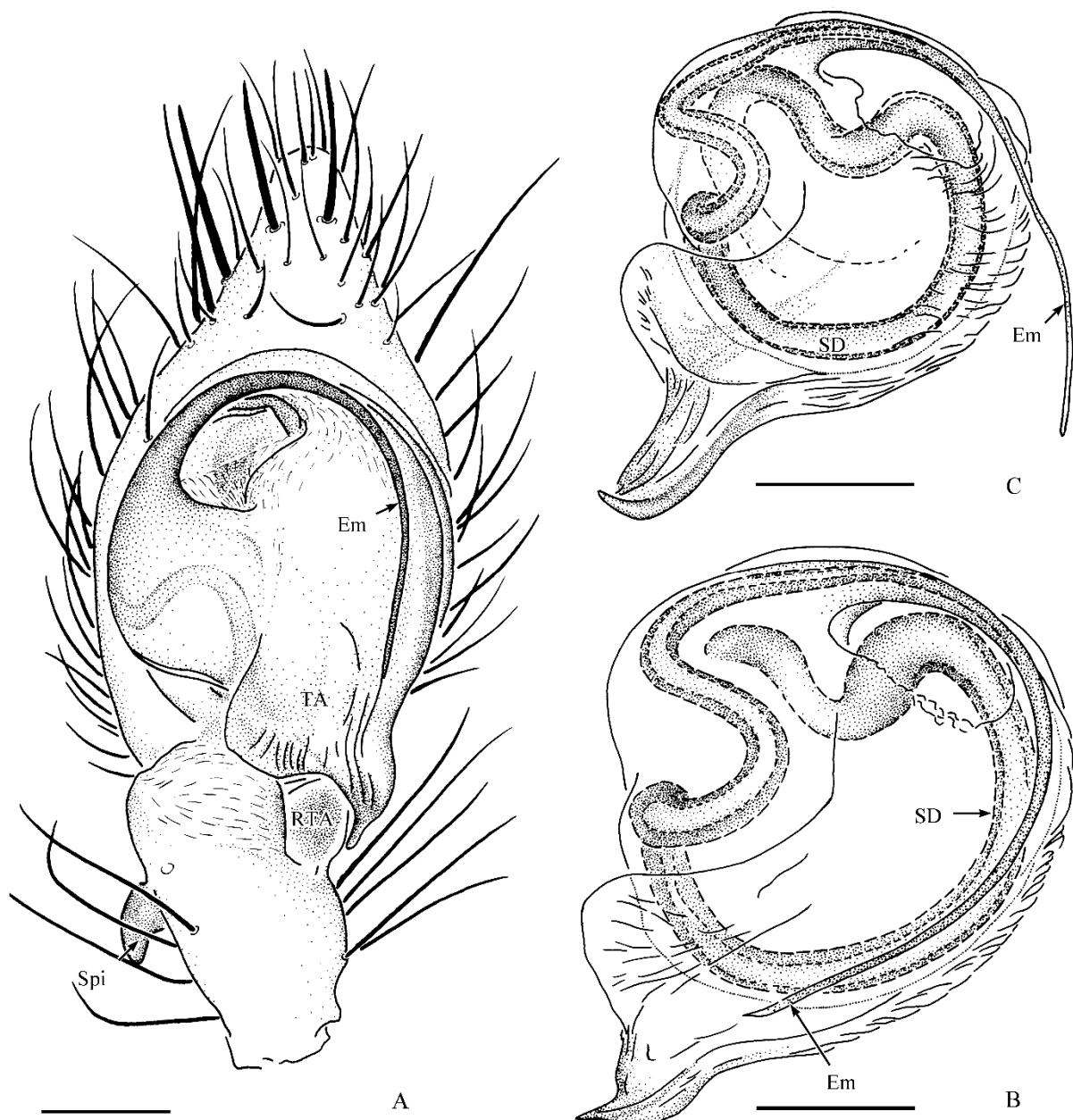


Figure 93. A–B. *Lathys inaffecta* Li, sp. nov., holotype, male. A. Left pedipalpus, ventral view. B. Palp bulb, ventral view. C. *Lathys chishuiensis* Zhang, Yang & Zhang, 2009, paratype, male, palp bulb, ventral view. Scale bars=0.1 mm.

Eye region length 0.35, width 0.18. Clypeus height 0.08. Chelicerae length 0.57, width 0.26. Chelicerae brown, with distinct lateral condyles, 3 (1 large, 2 small) promarginal and 8 retromarginal teeth. Labium and gnathocoxae brown; sternum yellow. Labium length 0.15, width 0.22. Gnathocoxae length 0.32, width 0.20. Sternum length 0.70, width 0.60. Legs light brown. Leg formula IV-I-II-III. Leg measurements: I 3.43 (1.00, 0.38, 0.87, 0.73, 0.45); II 3.26 (0.98, 0.38, 0.75, 0.68, 0.47); III 2.81 (0.80, 0.33, 0.60, 0.64, 0.44); IV 3.74 (1.10, 0.38, 0.88, 0.88, 0.50). Opisthosoma length 1.35, width 1.08. Opisthosoma yellow, with two rows of gray spots. No cribellum and no calamistrum.

Epigynum (Figs 88, 89A–B). Width 0.34. Epigynum with large atrium, as wide as long, median with setae. Bursae enlarged, fused at base. Spermathecae spherical. Fertilization duct laterally attached to the spermathecae base.

Male. Unknown.

Distribution. Known only from the type locality (Fig. 97).

### 3.3 Genus *Lathys* Simon, 1884

*Lethia* Menge, 1869: 249 (preoccupied by *Lethia* Hübner, 1816, in Lepidoptera).

*Lathys* Simon, 1884: 321. Type species: *Lethia varia* Menge, 1869 from Prussia (=*Lathys humilis* (Blackwall, 1855)).

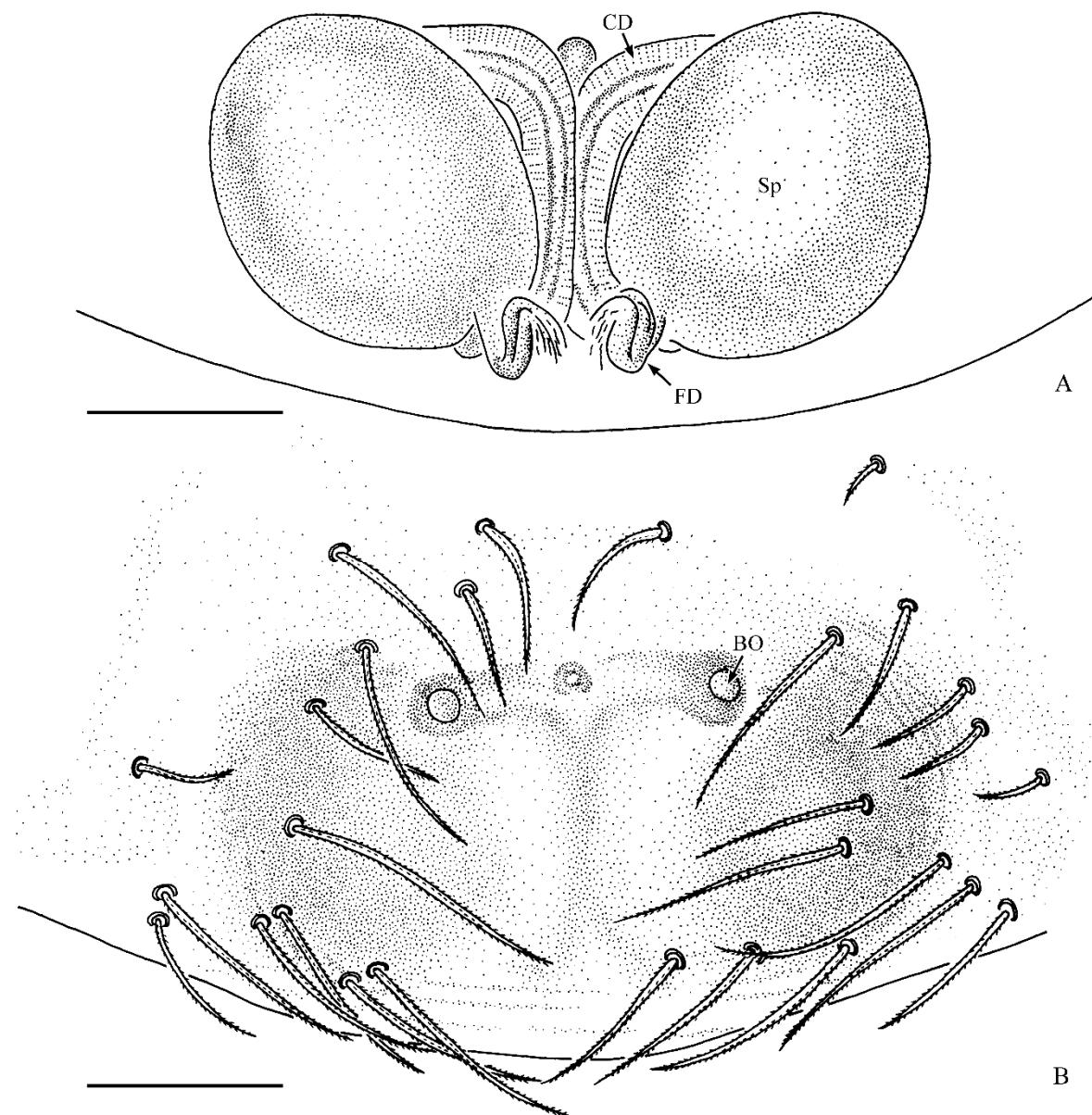


Figure 94. *Lathys inaffектa* Li, sp. nov., paratype, female. A. Vulva, dorsal view. B. Epigynum, ventral view. Scale bars = 0.1 mm.

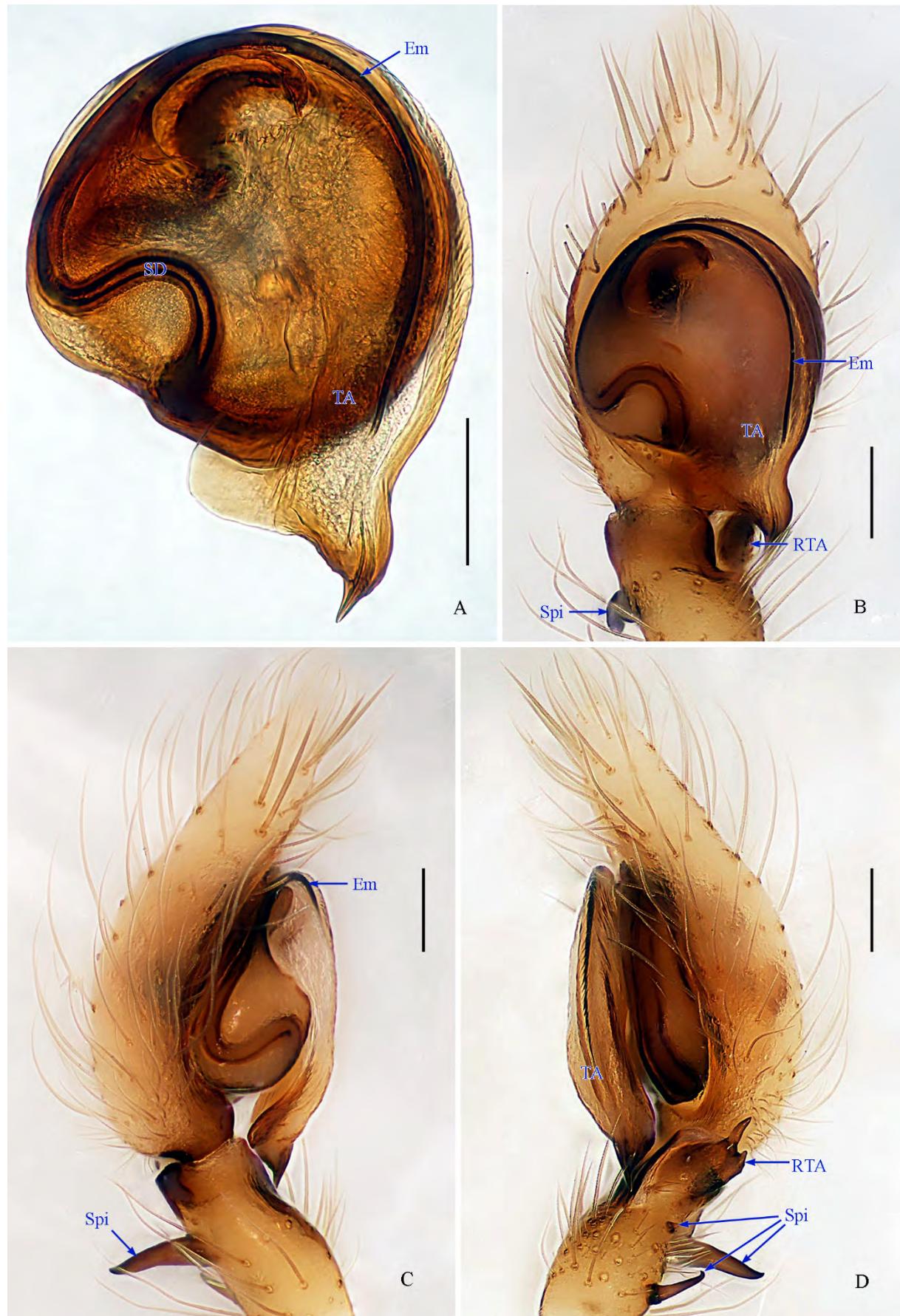


Figure 95. *Lathys inaffecta* Li, sp. nov., holotype, male. A. Palp bulb, ventral view. B. Left pedipalpus, ventral view. C. Left pedipalpus, prolateral view. D. Left pedipalpus, retrolateral view. Scale bars=0.1 mm.

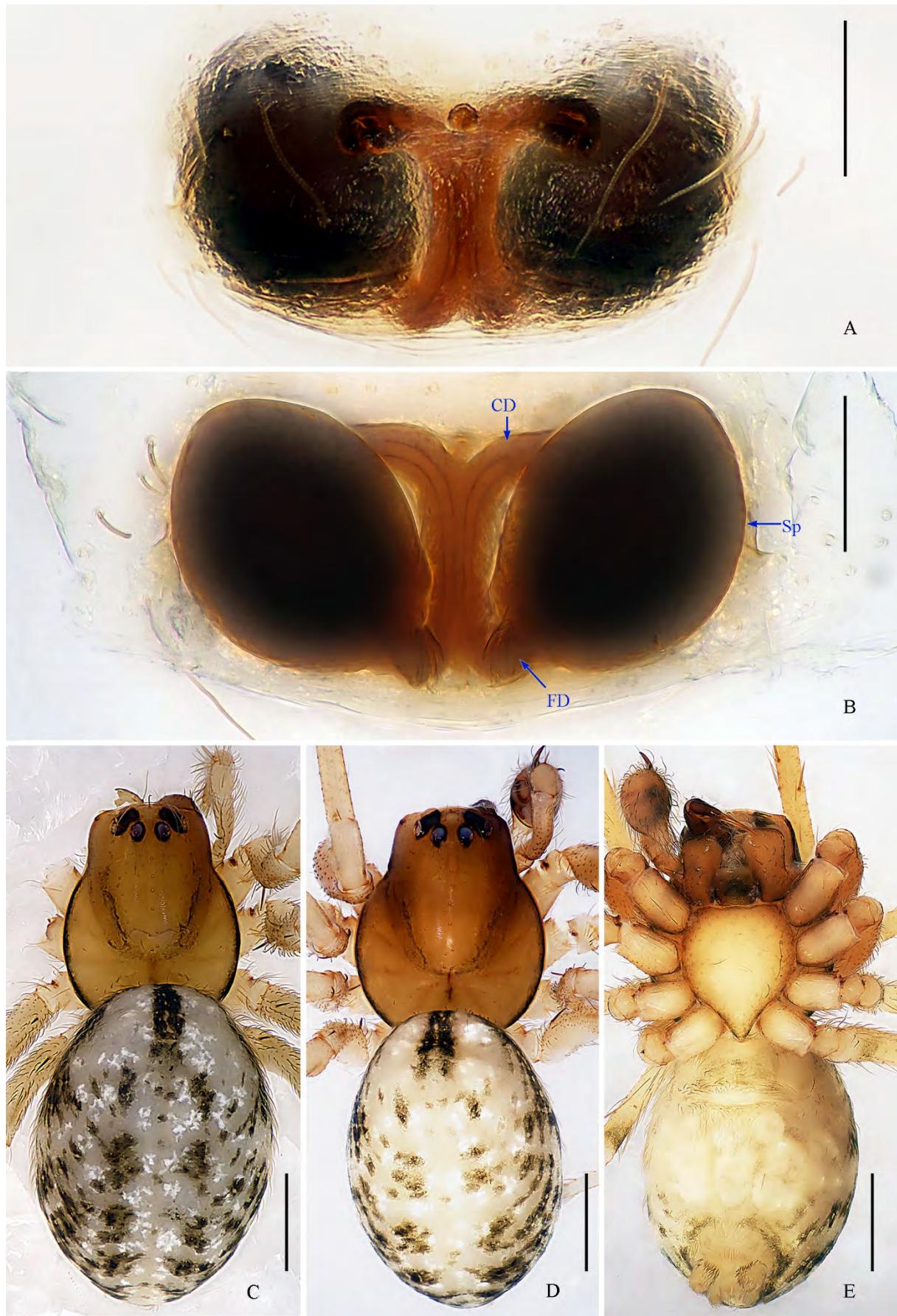


Figure 96. *Lathys inaffecta* Li, sp. nov. A–C. Paratype, female. D–E. Holotype, male. A. Epigynum, ventral view. B. Vulva, dorsal view. C–D. Habitus, dorsal view. E. Habitus, ventral view. Scale bars: A–B=0.1 mm; C–E=0.5 mm.

***Lathys inaffecta* Li, sp. nov.** (Figs 92, 93A–B, 94–97)

Type material. Holotype. Male, China, Guizhou, Kaili City, Zhouxi Town, Wangzhou Cave, 26°29.261'N, 107°55.416'E, elev. 704 m, 25 May 2007, Y. Lin & J. Liu leg., deposited in IZCAS. Paratypes. 2 females, same data as holotype, deposited in IZCAS.

Compared type material. Paratypes of *L. chishuiensis* (Figs 90–91, 93C), 1 male and 1 female, Suoluo Nature Reserve, Jinshagou, Guizhou, 28 May 2008, deposited in SWUC.

Etymology. The specific name is derived from the Latin word “*inaffectus*”, meaning “smooth”, and refers to the shape of the most conspicuous tibial spine; adjective.

Diagnosis. This new species is similar to *L. chishuiensis* (Zhang, Yang & Zhang, 2009; Figs 90–91), but can be separated by the smooth retro-dorsal tibial spine (with a row of denticles on the retro-dorsal spine in *L. chishuiensis*), TA prolaterally short, about 1/5 of TA length (about 1/3 of TA length in *L. chishuiensis*).

Description. Male (holotype). Total length 3.01 (Figs 96D–E). Prosoma length 1.33, with 1.14. Cephalic region width 0.74. Cephalic part strongly elevated, dark brown, with several setae. Thoracic part brown, furrows indistinct, fovea reduced. Prosoma margin black. Six eyes, PER procurred in dorsal view, AME absent. All eyes encircled with black. Eyes subequal in size. ALE 0.10, PLE 0.10, PME 0.10. Eye region length 0.26, width 0.47. ALE-ALE 0.17, PME-PME 0.09, PME-PLE 0.06. Clypeus height 0.07. Chelicerae length 0.67, width 0.32. Chelicerae dark brown, with distinct lateral condyles, 3 promarginal and 4 retromarginal teeth. Labium dark brown, gnathocoxae dark brown, sternum yellow-brown. Labium length 0.25, width 0.28. Gnathocoxae length 0.49, width 0.25. Sternum length 0.79, width 0.69. Legs yellow-brown. Leg formula I-IV-II-III. Leg measurements: I 4.84 (1.48, 0.44, 1.09, 1.14, 0.69); II 4.25 (1.14, 0.44, 1.09, 0.99, 0.59); III 3.81 (0.99, 0.40,

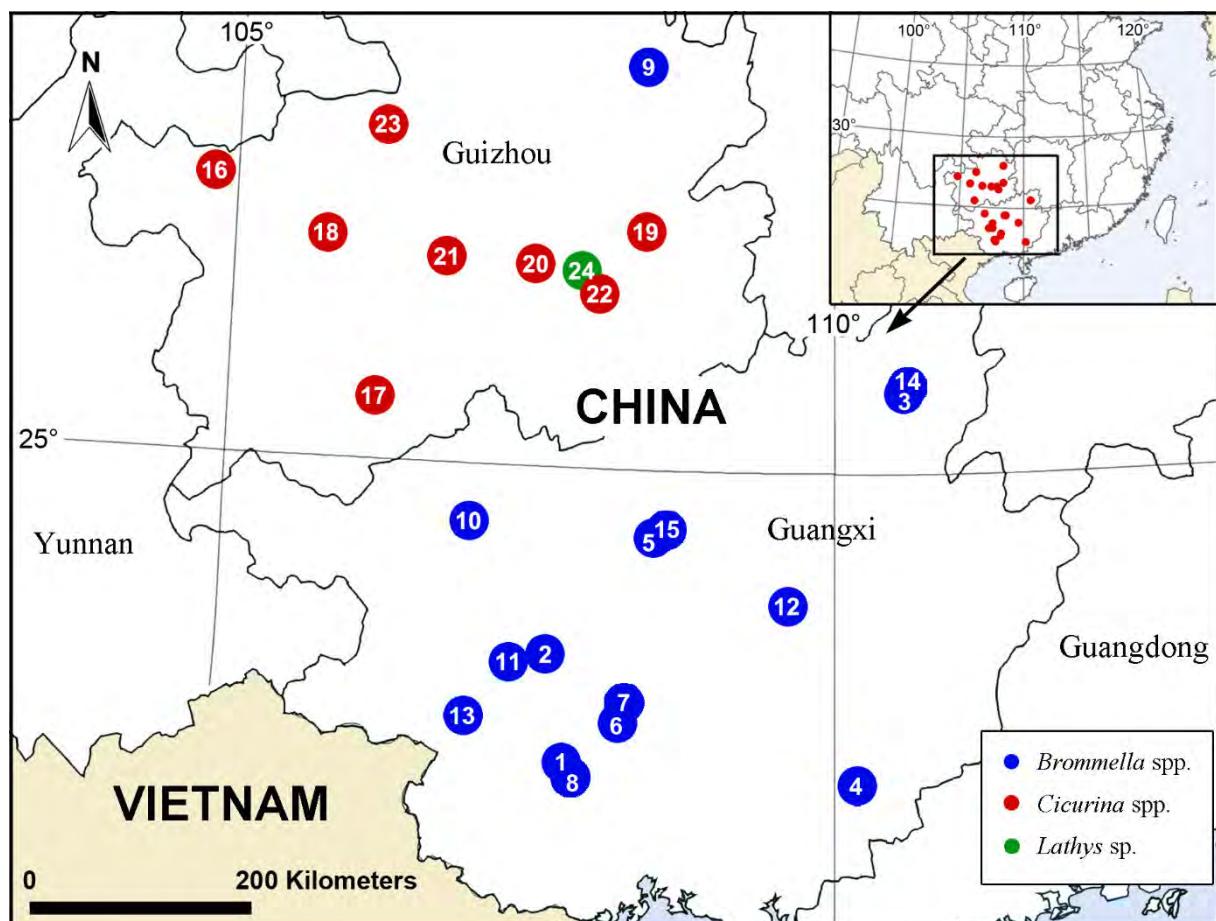


Figure 97. Locality records for twenty-four new species of Dictynidae. 1. *Brommella baiseensis* Li, sp. nov. 2. *B. casseabri* Li, sp. nov. 3. *B. chongzuoensis* Li, sp. nov. 4. *B. dolabrata* Li, sp. nov. 5. *B. funaria* Li, sp. nov. 6. *B. josephkohi* Li, sp. nov. 7. *B. linyuchengi* Li, sp. nov. 8. *B. renguodongi* Li, sp. nov. 9. *B. resima* Li, sp. nov. 10. *B. sejuncta* Li, sp. nov. 11. *B. spirula* Li, sp. nov. 12. *B. tongyanfengi* Li, sp. nov. 13. *B. wangfengcheni* Li, sp. nov. 14. *B. xinganensis* Li, sp. nov. 15. *B. yizhouensis* Li, sp. nov. 16. *Cicurina avicularia* Li, sp. nov. 17. *C. damaoensis* Li, sp. nov. 18. *C. dong* Li, sp. nov. 19. *C. kailiensis* Li, sp. nov. 20. *C. majiangensis* Li, sp. nov. 21. *C. parallela* Li, sp. nov. 22. *C. wusanani* Li, sp. nov. 23. *C. zhazuweii* Li, sp. nov. 24. *Lathys inaffecta* Li, sp. nov.

1.04, 0.84, 0.54); IV 4.58 (1.28, 0.44, 1.38, 0.99, 0.49). Ratio Cl/Met IV = 0.56, with 14 setae. Opisthosoma length 1.83, width 1.28. Opisthosoma pale yellow, with black anchor shaped pattern. Ventral without distinct pattern. Cribellum narrow, undivided.

Pedipalpus (Figs 92–93, 95) relatively large. Embolus relatively short, filiform, originating at approximately 12-o'clock position. TA prolaterally small and pointed. Prolateral of TA with a sheet apophysis. RTA with a tiny apophysis and a spine apically. Three spines present on the tibia, a prominent and smooth spine and a hooked spine on the dorsum of tibia, and a tiny spine located at the base of RTA. Apex of patella with a spine.

Female (one of the paratypes). Total body length 2.57 (Fig. 96C). Prosoma length 1.28, width 1.04. Cephalic region width 0.74. Eye diameters: ALE 0.10, PLE 0.10, PME 0.09. Eye interdistances: ALE-ALE 0.16, ALE-PLE 0.01, PME-PLE 0.07, PME-PME 0.09. Clypeus height 0.06. Chelicerae length 0.74, width 0.32. Chelicerae with distinct lateral condyles, 2 promarginal and 4 retromarginal teeth. Labium length 0.22, width 0.26. Gnathocoxae length 0.42, width 0.26. Sternum length 0.84, width 0.59. Leg formula I-IV-II-III. Leg measurements: I 4.24 (1.28, 0.44, 1.09, 0.89, 0.54); II 3.56 (1.09, 0.40, 0.84, 0.74, 0.49); III 2.80 (0.99, 0.35, 0.40, 0.64, 0.42); IV 3.80 (1.19, 0.44, 0.94, 0.79, 0.44). Ratio Cl/Met IV = 0.56, with 16 setae. Opisthosoma length 1.43, width 1.09. Opisthosoma white.

Epigynum (Figs 94, 96A–B). Width 0.37. BO small, round and sclerotized. Copulatory ducts short, touching at midline, forming an "X". Spermathecae large, oval, widely separated. Fertilization duct internally attached to the spermathecae base.

Variation. Total body length: females 2.57–2.85 ( $n=2$ ).

Distribution. Known only from the type locality in Guizhou, China (Fig. 97).

Remarks. The species differs only slightly from *L. chishuiensis* Zhang, Yang & Zhang, 2009. Zhang, Hu & Zhang (2012) excluded *L. chishuiensis* from *Lathys*, but could not transfer it to any of known genera. Zhang suggested erecting a new genus to include *L. chishuiensis* (personnal communication). Pending such a transfer to a new genus, we have also preliminarily placed *L. inaffектa* Li, sp. nov., along side with *L. chishuiensis*, in *Lathys*.

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